Evaluation of Tekes

Final Report

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Evaluation of Tekes

Final Report
In this report the evaluation of Tekes is presented. The report describes the rationale for Tekes and the role of Tekes in the Finish systems and evaluates its impacts. It is concluded that Tekes has performed well and is among the world’s leading innovation agencies. With its activities Tekes has contributed to increasing research intensity, increased cooperation between companies and knowledge infrastructure in for Finland important areas and in this way helped build knowledge and competences to increase the international competitiveness of Finnish enterprise.

The world is however changing rapidly and constantly. Tekes has taken these developments into account in its new strategy, aiming at renewal of sectors and at supporting start-up and high growth companies operating internationally. The new strategy seems to encompass a sensible shift in portfolio, taking in more risk but without making a complete break with the past.

Important points for improvement are Tekes’ support for internationalisation, its relation with other agencies in Finland (including regional representation) and the role of Tekes in public debate.

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The corporate governance [practice] of the Ministry of Employment and the Economy’s (MEE) includes a programme for developing the strategic performance, services and productivity of the Ministry and the organizations in its domain, ‘the MEE Group’¹. The aim of the development program is to meet the productivity goals, to improve effectiveness and to develop the operations of the MEE Group. On the other hand, an international evaluation of Finnish national innovation system in 2009 contained a recommendation that the Finnish public support system be evaluated. The recommendation was based on the view that both the governance and cost-effectiveness of the support system could be improved by reducing the complexity of the support system. Consequently, the Ministry decided to launch evaluations of two of its main funding agencies – Tekes and Finnvera plc. The Ministry commissioned two external, international evaluating teams to evaluate these two organizations at the end of 2011.

The aim of this evaluation was to evaluate the present and future-oriented operations of Tekes and its operation as part of the MEE Group. The purpose of this evaluation was also to form a view of Tekes as a future innovation policy actor by
• evaluating the efficiency, quality and impact of Tekes operations
• identifying the key challenges posed by the changing global environment to Tekes operations, and establishing in which ways Tekes could best have an effect on the national innovation environment and structural change of the Finnish economy through its operations
• formulating an independent opinion on Tekes’ role as an innovation policy actor of the future.

Furthermore, the aim of the evaluation was to assess the role of Tekes as part of the MEE Group by
• evaluating the performance of Tekes as an executor of the MEE Group strategy and MEE’s customer relationship management strategy
• evaluating the synergies between Tekes and other innovation system actors and the clarity of the division of responsibilities between Tekes and other MEE Group actors, particularly Tekes and Finnvera
• identifying the key structural and administrative needs for development for Tekes as an actor in the MEE Group.

The evaluation was carried out by Technopolis Group, assisted by VTT. To support the evaluation team, the Ministry set up a national sounding board which consisted of experts from different fields of Finnish enterprise and innovation system. On behalf of the Ministry, I would like to express my gratitude to everyone who participated in

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¹ Also known as ‘TEM muutosohjelma 2010’ (MEE change programme 2010).
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Tiivistelmä

Lyhyt yhteenveto

Tärkeitä kehittämiskohteita ovat Tekesin kansainvälistymiselle tarjoama tuki, suhde Suomen muihin virastoihin (kunnallishallinto mukaan lukien) ja rooli julkisessa keskustelussa.

Johdanto

Suomen haasteet, innovaatioiden merkitys

Innovaatiet ovat näin ollen Suomelle elintärkeitä, ja Suomen politiikka onkin pitkään ollut edistää tutkimus-, kehitys- ja innovaatiotoinnata (TKI).
Oikeus valtion väliintuloille TKI:n alueella


Tekesin rooli

Tekesillä on keskeinen rooli Suomen yhteiskuntapolitiikassa. Sen tehtävä on "edistää (suomalaisen) teollisuuden ja palveluiden kehittämistä teknologian ja innovaatioiden avulla. Tämä palvelee elinkeinon uudistumista sekä jaloitustarvion, tuottavuuden ja viennin kasvua. Lisäksi Tekes tavoittelee parannuksia työelämän laatua, työllisyyteen ja hyvinvointiin."

Tekesin tavoitteet ovat

1. Edistää tuottavuutta ja elinkeinon uudistumista (keskittyen nuoriin, innovatiiviin yrityksiin ja kasvuyrityksiin)
2. Kehittää sellaisia kyvykkyyksiä, joita tarvitaan innovaatioiden aikaansaamiseen (erityisesti innovaatiotoiminnan kansainvälistytyttä ja vahvoja, verkottuneita strategisen huippuosaamisen keskittymiä (SHOK))
3. Parantaa hyvinvointia (painottuen kestävän energian tuotantoon, terveydenhuolto- ja sosiaalijärjestelmään ja tietoyhteiskuntaan)
4. Tulevaisuuden Tekes (olla innostava, vaikuttava ja vastuullinen toimija)

Tekesin toiminta ja asiakkaat

Luvut sisältävät vuosittain 20-30 miljoonaa euroa EU:n rakennerahasto-ohjelmien rahoitusta.

Valtaosa Tekesin asiakkaista (5044 eli 93%) on yrityksiä. Yritykset ovat myös saaneet eniten rahoitusta (1,7 miljardia euroa viiden edellisen vuoden aikana) ennen yliopistoja (0,56 miljardia euroa) ja valtion omistamia tutkimusinstituutteja (302 miljoonaa euroa).

Diagrammi osoittaa Tekesin rahoittamien yritysten (yliopistot ja tutkimusinstituutit eivät ole mukana) saaman rahoituksen määrän suhteessa yrityksen kokoon.


Lähis kaksi kolmasosaa (64 %) Tekesin asiakkaista oli mukana vain yhdessä projektiissa aikavälillä 2007–11. Miltei kolmannes asiakkaista osallistui kahdesta viiteen
projektiin, 2,3 % kuudesta kymmeneen projektiin ja vain 1,6 % asiakkaita osallistui useampaan kuin kymmeneen projektiin.

Suurin Tekesin palvelemista teollisuudenhaaroista on tietoliikenne- ja elektronikka, joka on saanut 20 % Tekesin yritysrahoitusbudjetista. Seuraavaksi suurimmat alat olivat konetekniikka (17 %), ohjelmistokehitys ja digitaaliset mediat (14 %) sekä energia- ja ympäristöteollisuus (14 %). Lähis puolel Tokesi asiakkaita tulee Uudenmaan maakunnasta (Helsingistä ja sen lähiseuduilta). Kolme muuta maakuntaa, Pirkkanmaa (Tampere), Pohjois-Pohjanmaa (Oulu) ja Varsinais-Suomi (Turku), ovat myös melko vahvasti edustettuina (yli 5 % asiakkaita).

Tekesin relevanssi ja laatu asiakkaiden näkökulmasta
Tekesin asiakkaat, ja erityisesti niiden innovatiivisin osa, joka on Tekesin pääkohderyhmä, tuntevat "melko" tai "erittäin" hyvin suurimman osan Tekesin roolin ja toiminnan osalta. Samat ne ovat "melko" tai "erittäin" tietoisia hakumenettelystä ja (mikä tärkeintä) siitä, kenen puoleen Tokesilla kääntyä, jos heillä on kysyttävää.

Lähis kaikkien Tekesin asiakkaiden mielestä "T&K-projektien rahoitus" vastaa heidän tarpeisiinsa. Mitte puole (46 %) Tekesin asiakkaita oli sitä mieltä, että SHO-Kit olivat heille relevantteja, todennäköisesti johtuen näiden keskittymisestä tiettyille sektoreille. Ohjelmataloutta, kuten verkottuminen, seminaarit jne., olivat relevantteja 72 % mielestä sekä tieto- ja neuontapalvelut 69 % mielestä. Rahoitus nuorille innovatiivisille yrityksille (NIY) oli relevanttia 58 %:lle asiakkaita.

Tuloksettomat hakijat (ei-asiakkaat) pitivät NIY-rahoitusta huomattavasti tärkeämpänä kuin Tekesin olemassaolevat asiakkaita. Vastaavasti he pitivät neljää muuta tukimuotoa vähemmän merkittävinä. Toisin sanoen monet niistä, joiden tutkiahemus on viime vuosina hylätty, yhdistävät itsensä ennemminkin NIY-tukeen kuin muihin tukimuotoihin verrattuna Tekesin asiakkailta.

Noin 39 % Tekesin asiakkaita toivoi saavansa Tekesiltä tukea alueille, joille he eivät sitä täällä hetkellä saa, pääasiassa (i) kansainvälistymiseen ja kansainvälisillä markkinoilla toimimiseen, (ii) markkinointiin ja myyntiin ja (iii) markkinoille pääsemiseen (erityisesti startup-yritykset).

Tekesin prosessien (ennen hakemista, hakemisen aikana ja hakemisen jälkeen) ja henkilöstön laatua pidettiin erittäin korkeana kuten Tokesiaan laatu yleisestikin. Kehitystä toivottiin muiden virastojen puoleen ohjaamisessa, hakuprosessiin liittyvässä hallinnollisessa taakasssa, tuloksettomista hakemuksista annettua palautettaessa, arvioinnin ja valintaprosessien nopeudessa ja Tekesin neuvonjä liittämisessä sen asiakkaiden liiketoimintaan.

Tekesin tulokset ja vaikuttavuus
Tekesin perinteiset instrumentit korjaavat markkinoiden epätäydellisyksiä tarjoamalla taloudellisia ja muita kannustimia, jotka vähentävät innovaatiotoiminnan taloudellisia riskejää ja parantavat yritysten kykyä arvioida niitä. Tämä on erityisen tärkeää

Hyvin suuret yritykset, jotka ovat Tekesin "edunsaaajia", eivät käytä Tekesin rahoja sisäisesti, vaan käyttävät lähes koko rahoituksen pk-yrityksiin ja julkisiin tutkimuslaitoksiin, missä se tuottaa edunsaaajalle tärkeän tiedon tuottamisen spillover-vaikutuksena liiketoimintamahdollisuuksia, tietoa ja inhimillistä pääomaa.


Yleisesti

- Tekesin rahoituksella on suora ja voimakas vaikutus innovaatiotoimintaan
- Tekesin rahoitus on lisännyt innovaatiotoiminnan laatua ja määrää, kasvattanut yritysten tietopääomaa ja tuottanut enemmän spillover-vaikutuksia. Nämä koskevat muun muassa tuottavuutta, innovaatiotoiminnan uudistumista ja verkottumista.
- Tekesin rahoitus on naukaisut innovaatioita, jotka ovat lisänneet kasvuvauhtia, tukenet suomalaisen teollisuuden globalisoitumista sekä kaupallistaneet tuotteita, palveluita ja uusia liiketoimintaprosesseja. Rahoitus edistää
verkottumista, yhteistyötä, uusien alueiden tutkimusta ja tietämyksen kehitystä.

- On todisteita siitä, että Tekesin rahoitus lisää tuottavuutta ja liiketoiminnan uusiutumista yritysten tasolla. Tässä tarvitaan kuitenkin lisää tutkimuksia todistusaineiston määrän kasvattamiseksi.

Tekesin toimintojen vaikuttavuudesta pitkällä tähtäimellä (10–20 vuoden aikaväliä) ei ole tehty tutkimuksia. Vastaavista ohjelmista ulkomailla tehdyt tutkimukset ja Suomessa tehdyt case-tutkimukset kuitenkin viittaavat siihen, että Tekesillä on ollut merkittävä rooli monien teollisuusalojen (esim. metsäteollisuuden, palvelualan ja tele- ja viestintäalan) pitkän tähtäimen kehityksessä ja uusien alojen vakiinnuttamisessa Suomeen (esim. biomateriaalien). Rahoituksen tärkeimpiä vaikutuksia on ollut uusien inhimillisen pääoman ja organisaatioiden oppimisen klusterien kehityminen. Tämä ei ole ainostaan luonut pohjaa yksittäisille innovaatioille, vaan on kehittänyt koko innovaatiojärjestelmän kapasiteettia ja kyvykkyyttä.

**Tekesin tehokkuus**

Oleisesti

Meta-analyysimme Tekesin yleisestä vaikuttavuudesta taloudelliseen kehitykseen osoitti, että organisaatiolla on ollut ja on edelleen tuntuva myönteinen vaikutus, joka kiihdyttää innovaatioiden ja kasvun vauhtia. Saatavilla olevan todistusaineiston perusteella Tekes on täysin kansainvälisen maineen saavutuksella ja innovaatiokeruksena veroinen. Vaikka lisäanty havainnoita startup-yrityksiin ja pk-yrityksiin on hyödyllinen lisää Tekesin perinteen rooliin, olisi virhe luopua Tekesin ydintehtävästä tekologian alalla, jolla se tehokkaasti vastaa pysyviin tarpeisiin.

Startup-yritykset ja kasvuyritykset

Viime vuosina Tekes on pyrkinyt kasvattamaan uusia kasvuyrityksiä, aloittavia yrityksiä ja nuoria innovaattoriyhtymiä. Rahoitus alle kuuden vuoden ikäisille yrityksille on kaksinkertaistunut edellisen kymmenen vuoden aikana ollen yli 100 miljona euroa vuonna 2010 (noin 27% Tekesin kokonaisrahoituksesta T&K-toiminnalle). Julkista avustusta saaneiden yritysten osuus kaikista Suomen nopeasti kasvavista yrityksistä on 76%. Tekes on tukenut noin kolmannaista niistä.

Tekes on myös aktiivisesti osallisena yrityksissä, jotka ovat kehittäneet markkinoille uusia tai radikaaleja innovaatioita. Vaikka radikaalimia innovaatioita kehittäneiden pienten yritysten (10–15 työntekijää) määrä vähen 28% vuosina 2006–08, todennäköisesti talouskriisistä johtuen, Tekesin rahoittamien yhtiöiden osuus näistä nousi neljännekkästä kolmannekeen. Tekesin osallisuus radikaalimesta innovaatioista boothangiissä suuryrityksissä nousi 63 prosentista 71 prosenttiin.

Kansainvälistä analytykdit ovat tunnistaneet monia "kuumia" suomalaisia startup-yrityksiä. Tekes on ollut tukevassa kaikkia niistä.

Tekesin ohjelmia pidetään uraauurtavina huomion kiinnittämisessä tärkeille alueille kuten matkaviestintään, nanoteknologiaan ja biomateriaaleihin. Tätä Tekesillä on ollut huomattavasti vaikutusvaltaa tutkimus- ja kehitystyön uudistamisessa ja pohjan rakentamisessa elinkeinojen uudistumiselle. Tekes aloitti toimintansa rahoittamalla T&K-toimintaa, mikä on yhä sen kotikenttää ja missä se vaikuttaa ole-van mukavuusalueellaan. Tekesin perspektiivi on kuitenkin siirtynyt viime aikoina. Tekes on muuttanut sääntöjään, jotta sen olisi helpompi tukea julkisen ja yksityisen sektorin yhteistyötä ja pieniä organisaatioita.

On esitetty epäilyksiä, että Tekes ei kunnolla ymmärrä kuinka likeyritys tulee perustaa ja kuinka sitä tulee hoitaa. Liiketoimintaprojektien arviointia ja valvontaa pidetään Tekesin kehitysalueena, esim. "kevyempän" arviointiprosesseja, suurempaa panostusta auditointiin ja ankarmampia rangaistuksia sääntöjen rikkomisesta.


**Tekesin ohjelmat ja SHOKit**

Tekesin ohjelmien rahallinen koko ja kesto ovat kasvaneet merkittävästi tarkastelujakson aikana. Ohjelmat kuuluvat usein peräkkäisten ohjelmien sarjaan ja rakenta vat edeltävien ohjelmien aikana luodulle tuloksille ja verkostoille. Näiden sarjojen uudemmät ohjelmat keskittävät tyypillisesti selkeämmin liiketoimintavaikutuksiin (esim. liiketoimintamalleihin) ja institutionaalisiin muutoksiin (esim. alan käytäntöihin, alustoihin), kun taas aikaisemmat ohjelmat ovat keskittyneet selvemmän teknologiaan. Tämä johtuu palautteeseen ja arviointiin perustuvasta oppimisprosessista, muuttuneista innovaatiopolitiikan tavoitteista ja Tekesin roolin kehittymisestä.

Ohjelmat ovat Tekesin väline perustason verkostoitumiseen. Saatavilla olleiden ohjelma-arviointien perusteella suurimmalla osalla niistä on ollut katalyyttisiä vai kutuksia. Ohjelmat ovat

- edistäneet kohdealojen ja -klusterien yritysten ja T&K-organisaatioiden välistä verkottumista ja tuoneet yhteen tutkijoita ja alan ammattilaisia vaihtelevista taustoista
vahvistaneet T&K-työtä ja lisänneet tutkimusyhteistyötä alojen sisällä ja poikkitieteellisesti
• lisänneet alojen sisäistä tutkimusyhteistyötä
• edistäneet kyyvyyksien rakentamista ja osaamisen kehittämistä yrityksissä, millä on ollut positiivinen vaikutus kilpailukykyyn
• tukenet tietoisuutta, yhteenkerääntymistä ja yhteisten toimintatapojen syntymistä alan tai klusterin toimijoiden kesken
Vaikutukset teollisuudenharojen uudelleenjärjestelyyn ovat riippuneet alan kypsyydestä ja elinkaaresta. Orastavalla aloilla (esim. biomateriaaleissa) Tekesin panos on varsin selvä, sillä Tekes voi vaikuttaa tutkimuksen ja innovaatioponnistusten suuntaan rahoituksensa kautta. Kypsien teollisuudenalojen (esim. tehdastuotannon) rakennemuutokseen vaikuttaminen on ollut vaikeampaa johtuen teollisten rakenneiden jäykkyystä.


Tekesin hiljattain SHOKien rinnalle kehittämä ohjelmalähestymistapa vaikuttaa sopivaan aidoisti uusien kehityssuuntien löytämiseen ja organisoimiseen sekä innovatiivisten pk-yritysten tarpeisiin vastaamiseen. Tätä lähestymistapaa (ja erityisesti keskittymistä pk-yrityksiin) ja sen vuorovaikutusta SHOKien kanssa ei kuitenkaan vielä ole todennäköistä.

Palveluinnovaatiot, työpaikka innovaatiot sekä kysyntä- ja käyttäjälähtöiset innovaatiot

Tekesillä on niin ikään keskeinen rooli Suomen työpaikka innovaatioissa (ta työpaikkojen kehittämisessä). Kuten palveluinnovaatioissakin, teknologia ei ole tärkein...
elementti, vaan työntekijät ovat innovaation kantava voima. Tekesillä on työprosesseja, työn organisointia, valvontaa, työmenetelmiä ja verkottumista koskevia projekteja, joiden tavoitteena on tuottavuuden lisääminen ja työelämän laadun parantaminen. Tällä alueella Tekes omaksui työministeriön tehtävät, eikä ole vielä täysin integroinut niitä muuhun organisaatioonsa.


Kansainvälisesti viime vuosina on kiinnitettävä huomiota yhdysvaltalaiselle innovointielle. Yhdysvaltalaisessa innovaatiopolitiikassa on keskeinen taustana tuottavuuden lisääminen ja innovaatioiden edistäminen elinkeinon tasolla. Tekesin rooli käyttäjälähtöisessä innovoinnissa on alan sidosryhmien mukaan selvä. Se on käyttäjä–tuottaja vuorovaikutuksen edistäminen, osallistuminen osaamistason nostamiseen ja edistäminen elinkeinon tukemista.

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Julkisen sektorin innovaatiot ovat kysyntälähtöisen innovaation eräs muoto. Tekesin onnistuneesta osallistumisesta julkisen sektorin innovaatioihin on jo olmassa esimerkkejä, esim. energiankulutuksen vähentämistoimenpiteiden täyttöönpanossa ja rakennusten kestävää energiankäytössä. Johdonmukainen T&K -toiminnan tutkiminen, sääntöjoiden, edelläkävijöiden ja käyttäjien välisen yhteistyön edistäminen ja kysyynnän puolen toimenpiteet, kuten kokeilut, edelläkävijämarkkinoiden luominen ja hankinnat ovat olleet tärkeitä tutkimuotoja, jotka ovat edistäneet uusien tuotteiden ja palveluiden kehittämistä sekä energiankulutuksen vähentämisen julkisen tavoitteen toteutumista. Tekes vaikuttaa pystyvän tuottaja-puolen rooliin (alan tutkimiseen ratkaisujen luomisessa) julkisissa innovaatioissa. Tekes voi ainoastaan osallistua kysyynnän puolella kun valtiollisilla toimijoilla (tässä...
tapauksessa työ- ja elinkeinoministeriö sekä ympäristöministeriö) on selkeä tavoite, jonka voi selittää elinkeinoelämälle. Jos tavoitteet eivät ole selkeät (esim. nykyisessä terveydenhuoltotekniikassa), on ministeriön tehtävä ensin asettaa selvät tavoitteet. Vasta sen jälkeen Tekes voi toimia kysynnän puolella.

Julkisen talouden innovaatioiden tukeminen


Tekesin suhteet muihin suomalaisen järjestelmän tukiorganisaatioihin

Suomessa on monta toimijaa, joiden tehtävänä on tukea tiedettä, innovaatioita ja yrittäjyyttä. Tukijärjestelmä on, ainakin ensi silmäyksellä, melko monimutkainen.


- Päivittäinen yhteistyö Finpron ja Invest in Finlandin kanssa (laitokset tulevat yhdistymään) on hyvällä tasolla, mutta kaikki osapuolet hyötyisivät avoinemmasta ja strategisemmasta yhteistyöstä. Se olisi myös tärkeää suomalaisten yritysten kannalta. Finpron yksityinen rooli ja toiminta markkinoilla voi kuitenkin haitata avointa yhteistyötä.


- Sitran rahoituskysyky on rajallinen. Nämä ollen ei synny sekaannusta Sitran ja Tekesin rahoitusroolin välillä. Laitosten rooleista muutoksen alullepanijoina voisivat helpommin syntyä sekaannusta, mutta käytännössä yhteistyö on hyvää eikä konflikteja pääse syntyä. Yhteistyö ei kuitenkaan jälleen ulotu strategi-selle tasolle, ja järjestelmällisempi viestintä ja strateginen yhteistyö voi lisätä sen vaikuttavuutta.

Tekesin asiakkaille sitä tukea, mitä Tekes haluaisi heille tarjota (kriittisen massan arvioidaan olevan 10–15 henkeä Tekesin yksikköä kohti). Voi olla syytä harkita Tekesin osallistumisen vähentämistä viidestä seitsemään ELY-keskukseen ympäri maata. Finnveran ja Finpron alueellinen edustus tulee myös ottaa huomioon tätä muutosta tehtäessä.

Tekesin kansainvälinen rooli

Kansainvälistymisen muuttuminen "valtavirraksi" koko Tekesin organisaatiossa, kun kaikki Tekesin neuvonantajat omistavat osan ajastaan nimenomaan kansainvälisen T&K-yhteistyön edistämisestä, tarkoittaa, että kansainväliselle tieteelliselle ja teknologiselle yhteistyölle omistettu asiantuntunut on käynyt liian ohueksi Tekesin organisaatiossa. Tästä johtuen asiantuntumus EU:n T&K -asioissa ei saavuta asiakkaita, erityisesti yrityksiä, riittävän hyvin.

Tekesin tämänhetkisen FinNode-toiminta on melko matalan profiilin toimintaa, joka tarjoaa ”strategista tiedustelutietoa”, mikä tuntuu kiinnostavan suuria konserniyhtiöitä web-seminaarien kautta. Jotkut Tekesin ulkopuoliset taho ovat ehdottaneet Tekesin edustajille ulkomailla aktiivisempaa ”parinmuodostajan” roolia. Meidän näkemyksemme mukaan tällaiset toiminnot eivät kuulu Tekesin rooliin.

Tekesin organisaation tehokkuus
Tekesin ilmoituksen mukaan sen ydinrahoitusprosessien kulut (projektien arviointi) vastaavat 2,3 % sen budjetista. Osuus on pienentynyt viime vuosien aikana, koska budjetit ovat kasvaneet ja kulut pysyneet samoina. Tekesin koko organisaation kulut ovat kuitenkin huomattavasti suuremmat (8 % vuonna 2010, 10,5 % vuonna 2008). Näihin kuluihin sisältyy hallintokulut, sisäisiä kokouksia, asiakasyhteydenottoja,
analyyseja, ministeriön antamia tehtäviä jne. Verrattuna samankaltaisiin organisaatioihin Tekesin budjetin osuus Suomen bruttokansantuotteesta on merkittävästi suurempi kuin muiden laitosten. Tekesin kulujen osuus sen budjetista on sen sijaan huomattavasti muiden laitosten vastaavaa lukua pienempi.

Yleisesti ottaen apurahaohjelmien, joihin kuuluu vain rajattusi verkostoitumistoimintaa mutta joihin sisältyy ohjelmaviestintä, yleiskustannukset ovat 5–7 %. Tekesin raportoimia ydinrahoitusprosessin 2,3 % kuluihin ei kuulu ohjelmaviestintä eikä muu ohjelmatoiminta, mutta niitä ei missään nimesä voi pitää kovin korkeina. Alhaisten kulujen syitä lienevät varsin standardisoitu hakuprosessi, melko suurten hakemusten suuri suhteellinen osuus, projektihakemusten sisäinen arviointi (toisin sanoen Tekesin virkailijat arvioivat hakemukset), sähköinen hakumenettely ja pappirittomat tietoliikenteen tukijärjestelmät.

Tekesin vahva ”brändi” ja rajoitettu kohderyhmä vaikuttaa lisäävän tehokkuutta, koska viestintä voidaan kohdistaa pienelle kohderyhmälle ja viestintäkulut pysyvät alhaisina.

Tekesin hyvin monimutkaisen, moniulotteisen matriisiorganisaation yksinkeräistä ja ei-keskeisten tehtävien parempi hallinnointi mahdollisuuksia tehokkuuden, ulospäin suuntautumisen ja henkilökohtaisen energian lisäämiseen. Tämän pitäisi myös lisätä organisaation toiminnan määrätietoisuutta.

Muita aiheita


Lopuksi Tekes ei enää nauti järkkymättömästä asemasta julkinen keskustelussa. Tekesin erittäin puolustelusta, miltei kouristuksenomainen reaktio viimeaikaiseen kritiikkiin on heikentänyt sen imagoa. Sen väliputken kyseenalaistetaan poliittisessa ja julkinen keskustelussa. Tekesää vastaan on jopa järjestetty mielenosoitus. Tämän negatiivisen ilmapiirin hälventämiseksi Tekesin pitää muuttaa viestintänsä reagoivasta ennakoivaksi. Laitoksen ponnistuksista ja aikaansaannoksista viestiminen ei yksinään riitä. Tarvitaan intensiivistä, avointa osallistumista julkiseen keskusteluun. Tekesin tulisi (jälleen) olla julkinen keskusteluun johtaja ja mahdollistaja, joka tarjoaa laajan forumin kaikille yhteiskunnan osille, myös oman organisaa
tionsa laadukkaille puheenvuoroille.
**Yleiset johtopäätökset**

Yleisesti voidaan todeta, että Tekes on suoritetnut hyvin ja kuuluu todella maailman johtaviin innovaatiokeskuksiin. Tie apurahan tai lainan antamisesta kaupalliseen menestysinnovaatioon on kuitenkin pitkä ja usein hyvin epäsuora. Tekesin tekemän työn ja Suomen taloudellisen menestyksen välille ei näin ollen voi vetää suoria yhteyksiä. Tekes voi parhaimmillaan luoda joitakin menestyksen edellytyksiä. Tekes on kuitenkin toiminnallaan edistänyt tutkimuksen laatua, lisännyt yritysten ja tietoinfrastruktuurin välistä yhteistyötä Suomen kannalta tärkeillä alueilla ja täten tuottanut tietoa ja osaamista, joka on nostanut suomalaisten yritysten kansainvälistä kilpailukykyä.


Tärkeitä kehittämiskohteita ovat Tekesin kansainvälistymiselle tarjoama tuki, suhde Suomen muihin viras-toihin (kunnallishallinto mukaan lukien) ja rooli julki-sessa keskustelussa.
Executive Summary

Introduction
Finland has been an international leader in the field of science and innovation policy over the last 10–15 years, as its consistently high scores in the European Innovation Scoreboard show. This report presents the results of an evaluation of one of the key players in the system: Tekes, the Funding Agency for Technology and Innovation. The Technopolis group performed the evaluation on behalf of the Finnish Ministry of Employment and the Economy.

Challenges for Finland, importance of innovation
The world is undergoing profound changes, which affect Finland as much as other countries. Important trends are: globalisation, individualisation and specialisation, environmental sustainability and ageing. These trends do not work in Finland’s favour. Finland has a strong manufacturing tradition, which is not focused on individualisation and is threatened by low-wage competitors. The proportion of older people in the population is among the highest in the world and its location on the margins of Europe means it is far away from large markets. Further, Finland has a relatively small pool from which to draw talented people, a risk-averse culture and low (if rising) levels of entrepreneurship and private risk capital.

Innovation is therefore of crucial importance for Finland, hence the Finnish government has long had a specific policy to promote Research, Development and Innovation (RDI).

Rationale for government intervention in the RDI field
Governments everywhere need to intervene in the RDI domain because of market failures (private incentives to invest in research RDI are too low from a societal point of view) and system failures (linked to structural, institutional and regulatory deficiencies). Government interventions aim to create ‘additionality’, namely effects on society over and above those that would have been there in any case, e.g. additional research budgets from private or foreign sources, additional private and social returns and effects such as improving the knowledge, capabilities, organisation, networks and strategies of firms. There can also be a reason not to intervene: namely, government failure, which is when government policy interventions lead to an inefficient allocation of resources or distorts competition. However, there is no evidence of such failure in connection with Tekes.

Role of Tekes
Tekes plays a central role in Finnish public policy. Its mission is to: “promote the development of (Finnish) industry and services by means of technology and
innovations. This helps to renew industries, increase value added and productivity, improve the quality of working life as well as boost exports and generate employment and wellbeing."

Tekes objectives are to enhance

1. Productivity and renewal of industry (with a focus on young innovative companies and growth companies)
2. Capabilities for innovation activities (especially internationality of innovation activities and strong and networked Strategic Centres)
3. Well-being (focusing on sustainable energy, the social and health care service system, and the information society)
4. Tekes of the future (be an inspiring, influential and responsible actor)

Tekes activities and customers

In the period 2008-10 Tekes project funding increased from about €480 million to €633 million (+32%). In 2011 the funding stabilised.

Currently, 40% of the funding Tekes provides is need-driven ‘reactive funding’ based on bottom-up applications from all sectors and technology domains. This proportion has grown in recent years. The rest of Tekes funding is proactive, targeting specific policy measures at strategic focus areas, which are defined together with customers and partners. This proactive mode includes Tekes programmes, SHOKs and other small-scale strategic initiatives that address specific needs of different customer groups. Here Tekes own programmes have become less important in favour of the industry led SHOKs.
The vast majority of Tekes customers (5044, or 93%) are companies. Companies also received the greatest amount of funding (€1.7 billion over the last 5 years), followed by universities (€0.56 billion) and the state owned research institutes (€302 million).

![Distribution of TEKES funding by size of organisation (n=3,891)](image)

The figure shows the proportions of funding going to Tekes beneficiaries (excluding universities and research institutes) in different size categories.

In the period 2007–2010, the large and very large companies have seen a reduction in their total share of funding from 46% in 2007 to 24% in 2010.

Almost two thirds (64%) of Tekes customers were only involved in one project during the period 2007-11. Almost a third of the customers participated in 2-5 projects, 2.3% in 6 to 10 projects and only 1.6% of all customers participated in more than 10 projects.

The largest industrial sector Tekes serves is Telecommunications and Electronics with 20% of Tekes enterprise funding budget followed by Mechanical Engineering (17%), Software and Digital Media (14%) and Energy and Environment (14%). Almost half of Tekes customers are from the Uusimaa region (Helsinki and surroundings). Three other regions – Pirkanmaa (with Tampere), Pohjois-Pohjanmaa (Oulu) and Varsinais-Suomi (Turku) – were also relatively strongly represented (over 5% of the customers).

**Tekes relevance and quality from the customer’s perspective**

Tekes customers (especially the more innovative ones, which are its major target group) are ‘fairly’ or ‘very’ aware of most aspects of Tekes role and operations, including the types of support available, how to apply and (importantly) whom to contact at Tekes if they have an enquiry.

Almost all Tekes customers find ‘Funding for R&D projects’ relevant to their needs. Almost half (46%) of Tekes customers found SHOKs were relevant to them, probably because of their focus on specific sectors. Programme services (such as networking, seminars, etc.) were rated as relevant by 72% of the customers and information and advisory services by 69%. Young innovative Enterprise Funding (YIC) is relevant for 58% of customers.
Unsuccessful applicants (non-customers) rated YIC funding as of significantly higher relevance than Tekes existing customers, and rated each of the other four forms of support as of lower relevance. Thus, many of those who have failed to receive support over recent years associate themselves more with YIC than with the other forms of support, relative to the existing customer base of Tekes.

Some 39% of Tekes customers would like Tekes support in areas where the currently do not receive it, mainly for (i) internationalisation and working in international markets, (ii) marketing and sales, and (iii) entering markets (particularly in the case of start-ups).

Tekes is very well regarded with respect to the quality of its processes (pre-application, application and post-application), its personnel, and in general terms. Improvements are desired in: signposting to other agencies; the administrative burden associated with its application processes; feedback on unsuccessful applications; speed of appraisal and selection processes; and linking Tekes advice to its customers’ business practices.

**Tekes results and impacts**

Tekes traditional instruments tackle market failure by providing financial and other incentives that reduce the economic risks of innovation activities and increase companies’ ability to assess them. This is especially important for smaller and younger firms that cannot afford much risk. More risk-taking means more attempts to innovate, some of which are successful and lead to increased competitiveness and economic growth. The same incentives can lead to ‘behavioural additionality’ or learning, especially through acquiring increased absorptive capacity for technological and scientific knowledge. This capacity increases the firm’s ability to evaluate and take risks on its own account.

The very large firms that are major ‘beneficiaries’ do not use the Tekes money internally, but spend almost all of the funding in SMES and public research institutions where it will generate spillovers in the form of business opportunities, knowledge and human capital, in addition to providing knowledge of importance to the ‘beneficiaries’ of the grants.

SHOKs and Tekes technology programmes cluster research and industrial R&D activities and have been shaped towards using networks both as ways to signal the importance of individual research and innovation problems and as ways to capture spillovers. The state does not ‘pick winners’ at the level of individual companies but shares risk with, and generates spillovers for, a network of companies and people – increasing the likelihood that there will be a return on its investment.

There is clear empirical evidence of Tekes impacts. Many evaluations and impact studies show these. ETLA studies show ‘input additionality’, ie companies doing Tekes-funded R&D invest more of their own money in R&D than those without Tekes funding. A range of other studies find that this increased R&D spending is associated with increased employment, patenting, innovations and productivity.
Surveys of project managers in evaluations of Tekes programmes consistently find that projects increase companies’ interest in doing R&D in general, increase the willingness to take risk and productivity of R&D projects, increase networking, increase human capital and influence longer-term business strategies of companies. They raise competitiveness and economic performance. Two-thirds of companies believe Tekes funding leads to increased net sales. This is confirmed by studies based on Tekes own project data.

The Sfinno database on Finnish innovations also shows the importance of Tekes: Tekes funding significantly aided 51% of innovations recorded in the period 1985-2007. Tekes money was most important in relation to innovations with medium and high complexity.

Overall
- Tekes funding has direct and positive impacts upon innovation activities
- Tekes funding has increased the quality and quantity of innovation activities, increasing firms’ knowledge capital as well as the extent of spillovers. These affect, among other things, productivity, renewal of innovation activities and networking.
- Tekes funding has triggered innovations that increase the rate of growth, support globalisation of Finnish industry, commercialise products, services and new business processes. It contributes to building networks, cooperations, new research areas and knowledge bases.
- There is evidence that Tekes funding helps increase firm-level productivity and business renewal. Here, however, more study is needed to increase the amount of evidence.

There are no real (10-20 years) long-term impact studies of Tekes activities, but studies of similar programmes abroad and case study evidence in Finland suggest that Tekes also plays a role in the longer term development of various industry area (e.g. forest industries, service industries, ICT industries) and has been instrumental in establishing new fields in Finland (e.g. biomaterials). Key effects of funding have been the development of new clusters of human capital and organisational learning so as to develop the capacity and capabilities of the innovation system, not just to underpin individual innovations.

Tekes effectiveness

Overall
Our meta-analysis of Tekes overall impacts on economic development showed that the organisation has made and continues to make a substantial and positive difference, driving up the rate of innovation and growth. On the evidence available Tekes richly deserves its international reputation as a leading technology and innovation agency. While the increased focus on start-ups and small-scale entrepreneurship is a useful
complement to Tekes traditional role, it would be a mistake to abandon Tekes core function in technology, where it addresses effectively a permanent set of needs.

**Start-ups and growth companies**

In recent years, Tekes has attempted to breed new growth companies, new emerging companies and young innovative companies. Its funding to companies less than six years of age has doubled in the last ten years, and was over €100 million in 2010 (around 27% of the total R&D funding of Tekes).

The total share of high-growth (HG) companies in Finland that has received public aid is 76%. Tekes has supported approximately one-third of them.

Tekes is also actively involved in companies with new-to-market (or radical) innovations. While the number of small (10–15 employees) companies with radical innovations decreased with 28% in the period 2006-08 – probably due to the economic crisis – the share of these companies that received funding from Tekes rose from one quarter to one third. Tekes share of involvement in large companies with radical innovations rose from 63% to 71%.

International analysts have identified many ‘hot’ Finnish start-ups, all of which have been supported by Tekes.

Growth of Tekes young innovative growth companies is clearly faster than others. Given the poor supply of private risk capital, public funding is not displacing private funding. These companies are networking and network leaders. It appears that growth orientation and networking comprise a productive combination. YIC funding encourages businesses to focus, to be less reckless in their risk-taking and to improve their analysis and planning. They also become more aware of the limits of their abilities. Early internationalisation increases their ability to grow.

Tekes programmes are regarded as having been seminal in focusing attention on important areas like mobile communications, nanotechnology and biomaterials. Tekes has thus had a lot of influence on renewal in R&D, building a basis for industrial renewal. Tekes started with providing R&D funding, which is where its home turf still is and where Tekes seems comfortable. However, there has more recently been a shift in perspective. Tekes has changed its rules to make it easier to support public-private partnerships and small organisations.

There are concerns that Tekes lacks the skills fully to understand how to start, run and manage a business enterprise. The evaluation and monitoring of business projects is seen as an area of improvement for Tekes (eg through ‘lighter’ evaluation processes combined with greater emphasis on auditing and strict punishments when rules are broken).

More broadly, the Finnish system is seen as not producing enough breakthrough innovations and commercial results. Traditional R&D grants alone are insufficient for commercial success. By starting to give loans, Tekes is perceived as offering some of the right incentives to stimulate business. It is suggested that Tekes could strengthen its linkages with venture capital (VC), while not taking a VC role.
Tekes programmes and SHOKs

During the review period, the size of programmes in money terms as well as their duration has increased markedly. Tekes programmes often belong to a series of successive programmes, building on the results and networks created in preceding ones. Within these series, the more recent programmes typically have more explicit focus on business impacts (e.g., business models) and institutional change (e.g., industry practices, platforms), whereas earlier programmes were more clearly technology focused. This represents a learning process based on feedback and evaluations, shifting innovation policy goals, and the evolving role of Tekes.

Programmes are the Tekes instrument for more basic fundamental and networking. According to available programme evaluations, most of them have had catalytic effects. They have

- Promoted networking between companies and R&D organisations in the targeted fields and clusters and brought together researchers and industry professionals from many backgrounds
- Strengthened R&D and increased research collaboration between researchers within fields and across discipline borders
- Increased research collaboration within industries
- Contributed to building capabilities and develop competencies in companies which have had positive impacts on competitiveness
- Supported awareness raising, clustering and emergence of communities of practice among actors in a field or cluster

Impacts on industry restructuring have been dependent on industry maturity and life cycle. In nascent domains (e.g., biomaterials), the contribution of Tekes is rather clear, as it can influence the direction of research and innovation efforts through its funding in a new emerging field. In mature industries (e.g., manufacturing) contributing to structural change has been more difficult due to the rigidities in the industrial structure.

In introducing the SHOKs, Tekes addresses a need to signal about, and build critical R&D mass in, a limited number of thematic areas that matter to Finnish industry and society. They were intended to be similar to ‘competence centres’ in other countries. This evaluation suggests that SHOKs face the dangers of lack of a common vision (because of too little trust among participants), too short time horizons and crowding out of new challengers. Furthermore, the IPR regulations may be too open for companies to contribute their really good ideas. In our view, SHOKs or competence centres are the right way to go. The ongoing evaluation should provide a more detailed analysis.

The Tekes programme approach that was developed recently in addition to the SHOKs, seems appropriate for picking up and organising genuinely new developments and cater for the needs of innovative SMEs. This approach (especially the focus on SMEs) has however yet to prove itself, as has the interaction with the SHOKs.
Services innovation, work place innovation, demand and user driven innovation

Tekes has traditionally been very much technology orientated. Finland was one of the first countries to identify the importance of (innovation in) services, and the opportunities to improve revenues and/or get to new markets. Tekes quickly took this up and has been very active in project support, programme development (e.g., the SERVE programme since 2006) and at strategic level (e.g., EU state aid rules changed because of Tekes activity, making support for the service component in projects legal). Since 2008, Tekes investments in the service sector (excluding service innovation in industry) have been larger than its investments in manufacturing. From a European policy perspective, Tekes is a leader in this area.

Tekes also has a central role in workplace innovation (or workplace development: WPD) in Finland. As in service innovation, technology is not central: here the employee drives the innovation. Projects are on work processes, work organisation, supervision, working methods and networking, with the aim of increasing productivity and the quality of working life. Tekes took over the activities of the Ministry of Labour in this area and has not yet fully integrated them into the rest of the organisation.

Both types of innovation are useful as they take a broader perspective on innovation than the technological one, tap sources for ideas outside R&D and may lead to higher acceptance of project results. Tekes could usefully communicate more about these approaches and stimulate public discussion in these areas. Furthermore, these approaches could be used more widely within Tekes, not only in specific programmes, but as a part of all programmes. With respect to services innovation there should be more attention to supporting internationalisation of services as well as to global developments. An additional issue in the area of WPD is support for companies that do not aim for international markets. These companies are not in the target group of Tekes but WPD may be a very good way to encourage them to start to innovate. WPD knowledge should therefore also be transferred to business support organisations outside Tekes.

In recent years more and more attention has been paid to the demand side of innovation internationally. In Finland, a ‘Demand and User-driven Innovation Policy’ has been developed, consisting of: competence development; regulatory reform; new operating models for the public sector; and development of incentives. Demand-driven innovation policy is about stimulating demand so that demand for innovations is increased or innovations are diffused more effectively in society. “User-driven” innovation policy is about stimulating the involvement of users of products and services in the innovation process.

The role of Tekes in user-driven innovation is, according to shareholders in the field, clear, and is to promote user-producer interaction by taking user involvement into account when evaluating projects.
In 'demand driven' innovation according to stakeholders, Tekes role should focus on industry and help industry to create business.

A specific form of demand driven innovation is public sector innovation. There are already successful examples of Tekes involvement in public sector innovation, eg in implementing energy consumption reduction measures and sustainable energy in buildings. Here consistent support for R&D, promoting interaction between regulators, forerunners and users and demand side measures like experiments, creation of lead markets and procurement were important support options that have both contributed to development of new products and services as well as to realisation of the public goal of energy consumption reduction. In public sector innovation Tekes seems to be able to play a role on the supply side (support industry in creating solutions). On the demand side Tekes can only play a role when the problem owner(s) on the government side (here the Ministries of TEM and Environment) have a clear goal that can be explained to industry. In cases where goals are not clear (eg at present in health care policy) it is the task of the problem owning ministry to set clear goals first, only thereafter Tekes can play a role on the demand side.

Fiscal innovation support

In Finland there has never been fiscal support for R&D. Soon, however, a new fiscal instrument will be introduced. Although a full ex-ante evaluation of this new scheme is outside the scope of this evaluation (and there is much debate about effectiveness and efficiency of fiscal R&D support) it seems that the intended Finnish fiscal scheme, aiming to support companies in hiring R&D personnel and with fairly low support ceilings per company, will not be at cross-purposes with Tekes interventions. The scheme will be primarily attractive for companies with limited R&D capabilities that are outside Tekes target group. It may even have synergy with Tekes because of this other focus and may help to bring new companies into the Tekes target group.

Relation of Tekes with other support organisations in the Finnish system

In order to support science, innovation and entrepreneurship Finland has many public players creating, at least at a first glance, a rather complex support system.

• Tekes funding for the public research community is €250m (2010). The Academy of Finland funds €320m (2012) of public research annually. Tekes is more focused on the technical and applied sciences, for which Tekes funding is larger and more important than Academy funding. The division of attention between Tekes and the Academy is clear for those involved. Whether the budget division between curiosity-driven research (Academy) and value-driven research (Tekes) is correct is more a political question than a scientific one. In practice, there is a lot of collaboration on the 'shop floor' based on personal relations. The cooperation could be more strategic, focused on a better joined-up research and innovation policy for Finland and a joint approach to international collaboration.
Finnvera’s mission is to strengthen enterprises’ competitiveness using financial instruments (loans, domestic guarantees, venture capital investments, export credit guarantees and other services associated with the financing of exports) and thereby to promote employment and regional development. Finnvera has 5 times as many customers as Tekes, but the overlap in customers between Tekes and Finnvera is rather limited. Only 31.5% of Tekes customers are also Finnvera customers. This is valid for all size classes of customers, types of customer and across all sectors and suggests that exchange of information on customers and joint service offerings between Tekes and Finnvera might offer opportunities for both to broaden their customer base. The programmes of both organisations clearly show overlap in goals, and possibly also in target group. The way in which the instruments work is, however, rather different. The target groups seem to understand the differences and see the synergies for them. They do not see the overlap as a large problem. However better signposting between the organisations seems possible and structural cooperation should be increased to reap the possible synergies. There is a strong reason for keeping Finnvera and Tekes separate: namely that it is unhealthy to have the same organisation fund both the development and the commercialisation of the same technology.

Day-to-day cooperation with Finpro and Invest in Finland (the two will merge) is good, but a more open and strategic cooperation would benefit both, as well being of importance for Finnish companies. The private role of Finpro, and the fact that it operates in a commercial market may, however, hamper open cooperation.

Finnish Industry Investment Ltd (FII) is a government-owned investment company. In the area of start-ups they do have a significant overlap in customer base with Tekes, many of their (tech related) ventures have also had Tekes project support. By operating commercially and owning equity the FII role is completely different from Tekes. Customers seem to recognize this. Cooperation between both parties is generally good, but cooperation may be somewhat more ambitious and formalised, and may include the Finnvera VC funds as well.

Funding means of Sitra are limited, and therefore there is no confusion with the funding role of Tekes. In its role of change agent, however, there may be less clarity about roles, but in practice there is good cooperation and conflicts do not occur. The cooperation is, however, again not really at a strategic level, and a more structured communication and strategic cooperation may increase impact.

The regional offices of Tekes are located in the ELY centres, (regional Centres for Economic Development, Transport and the Environment): 87 Tekes experts are located across the country in the ELY centres, and although formally employed (and paid) by the ELY centres, they are operationally part of Tekes and work to implement the Tekes strategy. Tekes customers think it is important to be able to access Tekes services at a local/regional level and appreciate
the TEKES services in the ELY centres. According to respondents in the ELY centres, Tekes impact on the development of regional innovation systems has been immense. Tekes provides huge expertise and connections to the global systems for the regions. If for a good the regional representation of Tekes in the ELY centres is to work well, it is important that regional and national innovation strategies are aligned. This is not always the case. The new Tekes strategy (focusing on companies that operate internationally) might increase the tension between ELY centres and Tekes, because this strategy reduces the number of companies in the Tekes target group, and therefore also the number of regional companies in the target group. The already very small numbers of Tekes people in ELY centres in some regions will then become even smaller and will often be sub-critical, not able to provide the support that Tekes wants to offer its customers. (Critical mass is estimated at 10-15 persons per Tekes unit). It is worth considering reducing the number of ELY centres with Tekes participation to perhaps five to seven, spread around the country. Regional representation of Finnvera and Finpro should also be taken into account in this change.

International role of Tekes
Tekes has interpreted its key task regarding internationalisation in terms of helping firms to enter and expand in international markets, thus directly related to the new segmentation of companies and the focus on growth companies with a capability to export. This means that explicit cross-border R&D collaboration has a lower visibility in the Tekes activity portfolio, as it is seen as an indirect means to the key objectives. Finnish companies and researchers can use instruments for cross-border R&D cooperation, including the various EU funded programmes and collaboration agreements with countries such as the USA, China and Japan. As internationalisation is a cross-cutting goal firstly defined by the Tekes customers, an explicit strategy focusing on certain geographical or thematic areas is not present. The Finnish ministries could usefully consider dedicated R&D collaboration schemes with regions outside Europe in priority fields that fit well with the Finnish national priorities. In addition, defining Finland’s position in Horizon2020 and the emerging Joint Programming initiatives and the role that Tekes can play as an intermediary would also require strategic choices where to focus Finland’s resources.

The ‘mainstreaming’ of the internationalisation throughout the Tekes organisation with Tekes advisors allocating a small part of their time explicitly to promote international R&D cooperation, means that the dedicated advice on international S&T collaboration has become spread too thinly in the Tekes organisation. Expertise on EU R&D matters is therefore not reaching the customers, in particular the companies, sufficiently well.

The current FinNode activities of Tekes are at relatively low key and provide a ‘strategic intelligence function’ that seems to interest large group companies
through web-seminars. While some outside Tekes have suggested a more active ‘matchmaking’ role of Tekes representatives abroad, in our view the provision of ‘matchmaking’ functions goes beyond the scope of Tekes role.

**Tekes organisational efficiency**

Tekes states its costs for the core funding process (assessing of projects) are 2.3% of the budget. They have decreased over the past few years because budgets increased and costs remained stable. Total costs of the Tekes organisation are, however, much higher (8% in 2010, coming down from 10.5% in 2008). These costs include management costs, internal meetings, customer contacts, analysis, tasks for the Ministry, etc. In comparison with like organisations Tekes budget as part of Finnish GDP is significantly higher than that of the other agencies. Tekes costs as share of their budget are, however, significantly lower than at other agencies.

In general, grant programmes with only limited networking activities but including programme communication have a programme overhead of 5% to 7%. The 2.3% costs for the core funding process as reported by Tekes excludes programme communications and all other programme activities, but can certainly not be called very high. A fairly standardised process for all applications within Tekes, a good proportion of proposals of fairly large size, internal evaluation of project applications (ie by Tekes officers), electronic application procedures and paperless ICT support systems are probably underlying causes for the low costs.

In addition, efficiency seems enhanced by the fact that Tekes has a strong ‘brand name’ and a limited target group, so communication can be kept rather focused and communication costs can be low.

Opportunities for further efficiency improvement and increased outside focus and personal energy can be obtained by simplifying the very complex multidimensional matrix structure of Tekes and by better management of the non-core tasks of Tekes. This should also increase operational decisiveness.

**Other issues**

During its history, the focus of Tekes has gradually shifted from R&D cooperation to technology policy to innovation policy. Accordingly, activities also moved more and more into supporting the private domain. This slow shift is also visible in the governance of Tekes: SHOK research programmes are decided upon by industry, the Board has become more industrial and the new DG has an industrial background. Although it is far too early to assess the effects of these changes in governance, a good balance is needed between strategic research (for long term renewal of Finnish firms and the Finnish firm base) and shorter term R&D addressing more immediate company needs.

Finally Tekes no longer has its previously unassailable position in public debate. The very defensive, almost cramped reaction of Tekes to recent criticism has weakened its images. Its interventions are questioned in political and public debate.
A rally against Tekes has even been organised. In order to reverse this negative atmosphere Tekes must refocus its communications, and become more proactive, not reactive. This does not only mean communication of efforts and effects, but an intensive open participation in public discussion. Tekes should (once again) be a leader in public debate, as a facilitator giving broad platform to contributions from all parts of society, including high quality contributions from its own organisation.

**Overall conclusions**

Overall it can be concluded that Tekes has performed well and is indeed among the world’s leading innovation agencies. The road from giving a grant or a loan to a commercial success innovation is however long and often very indirect. Tekes efforts and economic performance of Finland can therefore not directly be linked. At best, Tekes can create some of the conditions necessary for success. However with its activities Tekes has contributed to increasing research intensity, increased cooperation between companies and knowledge infrastructure in for Finland important areas and in this way helped build knowledge and competences to increase the international competitiveness of Finnish enterprise.

The world is however changing rapidly and constantly. International challenges (at some points aggravated by national circumstances) require more attention to the renewal of the industrial base, focusing on companies able to excel in international markets. Tekes has taken these developments into account in its new strategy, aiming at renewal of sectors and at supporting start-up and high growth companies operating internationally. The new strategy seems to encompass a sensible shift in portfolio, taking in more risk but without making a complete break with the past.

Important points for improvement are Tekes support for internationalisation, its relation with other agencies in Finland (including regional representation) and the role of Tekes in public debate.
Introduction

Consecutive high scores in the European Innovation Scoreboard show that Finland has led the field of science and innovation policy for the last 10-15 years. This evaluation assignment by the Finnish Ministry of Employment and the Economy gave us the opportunity to look at the successful Finnish science and innovation policy system, and more specifically at one of the key players in the system, the innovation agency Tekes.

The goal of the evaluation was to look back as well as to develop an outlook— with a time horizon up to 2020 – on the role of Tekes as one organisation in the TEM-concern in the national and international environment.

More specifically the evaluation has looked at:

• The **efficiency** of Tekes (as an organisation) and its key activities
• The **quality** of the operations and services provided by Tekes
• The **effectiveness** of the activities of Tekes, also in relation to a changing customer base
• The role of Tekes in the Finnish innovation system and its **contribution** to the TEM-concern strategy
• The **challenges** that Tekes faces given international developments and structural industrial changes that have an impact on Finland

A mixed methodology approach was chosen to address the above issues, including a desk study, a customer survey, interviews (inside and outside Tekes) and a number of round table discussions with Tekes stakeholders and international experts.

In this report the results of the evaluation are presented.

Chapter 1 addresses Tekes mission and strategy and the challenges it faces in the changing world. Chapter 2 focuses on Tekes customers and activities. Chapter 3 takes the customer’s' perspective and describes Tekes relevance and quality. Chapter 4 is central for the evaluation and analyses the results and impacts of Tekes interventions. Chapter 5 then analyses in more detail the effectiveness of Tekes instruments and interventions. The position of Tekes in the Finnish public support system is analysed in chapter 6. The role of Tekes in the internationalisation of Finnish companies is described in Chapter 7. Chapter 8 looks at the organisation of Tekes, its efficiency and its governance. Chapter 9 summarises the conclusions of the evaluation and gives recommendations at policy level as well as at Tekes more operational level.
1 Tekes strategy

Tekes is the Finnish Funding Agency for Technology and Innovation. It is one of the agencies of the ministry of Employment and the Economy (TEM) and its funds come from the Finnish state budget via TEM. Financing from the European Regional Development Fund (ERDF) provides an additional source of financing for (public) R&D projects.

In this chapter Tekes strategy is analysed.

1.1 Tekes 2008 strategy

Tekes bases its operations on its mission, vision and the values defined by them. Tekes mission statement for the 2008 strategy is:

Tekes boosts the development of Finnish industry and the service sector by technological means and through innovation. This will renew the economy and increase added-value, productivity and exports, thereby creating employment and enhancing wellbeing.

The vision is that:

Tekes is a leader in boosting innovation.

Tekes values are formulated as:

Tekes and its staff value and aim to promote the wellbeing, vision, trust, cooperation and development of society, customers and colleagues

The key objectives are:

- Strong knowledge base of important areas of R&D and innovation, i.e. to enhance capabilities in innovation activities. The focus is on internationality of innovation activities and strong and networked Strategic Centres.
- Enhance productivity and renewal of industries, with a focus on young innovative companies and growth companies
- Combine economic growth with the wellbeing of people and the environment, with a focus on sustainable energy economics and environment, a high-quality social and health care service system and services and platforms for the information society.
These objectives are to be achieved through four core processes:

- Strategy, i.e. foresight, evaluation and innovation research as well as strategy creation and communication
- Customerships, i.e. building relationships and delivering customer service through CRM and new client acquisition, activation projects and tailored offerings as well as marketing/communication
- Programmes, i.e. Tekes programmes, Strategic Centres for Science, Technology and Innovation (SHOKs) and international cooperation initiatives
- Funding, i.e. R&D funding for companies, funding for public research and special innovation funding

Tekes strategic focus areas are defined in terms of specific themes and practices as well as cross-cutting competences and technologies.

- The themes and practices are more general objectives that require convergence of people, technologies, economy and environment. The prioritised themes and practices include: (1) wellbeing and health, (2) knowledge society for all, (3) clean energy, (4) scarce resources, (5) built environment, (6) intelligent systems and environments, (7) service business and service innovation and (8) interactive media
- The crosscutting competences and technologies are those required by the thematic choices and focus areas. These are: (1) information and communications technologies; (2) materials applications; (3) biotechnology; (4) business competence; (5) service competence and (6) societal competences.

In addition, there are strategic areas defined from the cluster perspective. Each cluster has several cluster-specific focus areas, which were further defined in the 2006 decision for establishing Strategic Centres for Science, Technology and Innovation (SHOKs).

1.2 Tekes 2011 mission and strategy

In the new Tekes strategy ‘Growth and wellbeing from renewal’, the mission has remained the same. A stronger emphasis is given to the realisation that success and continuous renewal of the industries are a precondition for sustainable growth and the wellbeing of people and the environment. Consequently, Tekes has decided that its main target groups for funding are forerunners aiming on significant renewal. Priority is given to growth-seeking, innovative SMEs. Tekes seeks to allocate part of its R&D funding to areas offering significant opportunities for renewal and growth, guided by selected focus areas.

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1 The nine identified clusters are: (1) information and communications cluster; (2) metal cluster; (3) forest cluster; (4) wellbeing cluster; (5) chemical and bio cluster; (6) environmental cluster; (7) energy cluster; (8) real estate and construction cluster; and (9) food cluster.

2 “Tekes promotes the development of industry and services by means of technology and innovations. This helps to renew industries, increase the added value and productivity, improve the quality of working life, as well as boost exports and generate employment and wellbeing.”
The strategy is based on an analysis of challenges that Finland faces. Economic growth through increased productivity (i.e. innovation) is essential to meet these challenges. The main challenges identified by Tekes are a changing global division of labour, energy and environmental issues, ageing, rapid advancement of technology and state budget deficit.³

In our evaluation study we identified a similar, somewhat broader set of challenges. A number of issues are important for the Finnish economy and society. Some of these are specific for Finland, others are more generic but offer specific challenges or opportunities for Finland.

• **Globalisation** is an omnipresent trend. Global value networks are more and more important and production is easily (re-)located in low cost countries. Finland is rather vulnerable because of its (relatively) large dependency on (manufacturing) industry and its large proportion of mainly nationally operating SMEs that have limited access to international networks while facing increasing competition from abroad on their home market. Nokia is of specific interest, because this is an important player in the Finnish economy that faces serious threats. However, globalisation also offers larger markets for Finnish producers – if they want to and are able to get there.

• In relation to globalisation, **technologies will advance and be transferred rapidly** around the world. This poses threats (see above) but also opportunities for both Finnish companies (to get foreign technology in) and Finnish knowledge institutions (to make use of international cooperation to be among the technology leaders).

• **Individualisation and specialisation** are trends that will spark demand for tailored and individual solutions, based on usability and comfort. Margins for service solutions are in general much higher than margins on hardware sales and although Finland is to a larger extent a manufacturing country more than other western states, the Finnish/Scandinavian culture promotes user interaction and co-development of services.

• **Environmental sustainability** has moved from the public and political agenda to some extent but the problems remain. Although it may lead to operational constraints for traditional industries, it also offers huge opportunities to participate in international markets.

• **Ageing** will lead to a lower percentage of the population working and higher costs for health care. Finland already has one of the most aged populations in the world. This poses strong demands on the future generation and makes it necessary to increase the labour productivity of the healthcare system. While

³ The challenges are identified as:
- Global division of labour is changing and operations are moving to global value networks
- Social structures will change due to urbanisation and ageing of population in industrial countries
- Demand for environmentally sustainable solutions will grow, while ecological issues are not as yet of interest to everybody
- Demand for tailored and individual solutions will grow, driven by demanding end users and user groups
- Technologies will advance and be transferred rapidly around the world
- Development will be guided by usability and user experience, throwing technology into the background
this can be seen as a threat, it may also give Finnish companies an opportunity to develop solutions and create an advantage to operate in world markets later on.

- International operation requires a **culture of risk taking and entrepreneurship** which Finland lacks, although in recent years entrepreneurs are becoming role models more and more and education for entrepreneurship has become part of curricula in universities.

- **Levels of private investment money** are low in Finland. They are, however, rising due to the increasing number of wealthy people in Finland and the changing atmosphere towards entrepreneurship.

- Finland is a country on the brink of Europe, far away from large markets, traditional trade flows and large gatherings of people. It has a relatively small population and therefore a relatively small pool to draw talented people from. In addition, it has a climate which many do not find attractive as a living environment. This poses extra challenges for innovation policy: how do you attract foreign investments and foreigners?

In the concluding chapter, we will assess whether Tekes mission and strategy provide an adequate answer to these challenges.

Having identified innovation as key to meeting the challenges that face Finland, Tekes sees a clear rationale for government intervention in stimulating innovation activities of enterprises. The rationale is based on market and system failures and positive additionality and impact on capabilities creation.

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**Rationales for government intervention in theory**

Policy interventions in RDI can be justified by both market and system failures' arguments. In neo-classical economic literature, policy support for RDI is traditionally justified with the argument of market failures. This rationale is based on the difference between the social benefits and the benefits of those investing in RDI. The larger the difference between social returns and private returns, the larger the spillovers from the private party to the rest of society and the less willing the private party will be to invest at the socially optimal level. In other words, without government intervention, the investments in RDI would be too low from a societal point of view. In general, market failures can occur due to the existence of externalities and spillovers (typical for R&D investments), imperfect and asymmetric information (typical for financial markets), network failures and market power.

In more recent evolutionary and systemic conceptualisations additional rationales are found in 'system' failures. System failures are linked to structural, institutional and regulatory deficiencies, which affect RDI activities. They are the result of issues such as path dependencies, technological lock-in, investment
timing, institutional constraints, coordination failures, complexity of knowledge bases and the ineffectiveness of mechanisms facilitating knowledge flows.

In the system failure rationale, the government should not just provide additional resources to amend underinvestment but its intervention should focus on stimulating interactions and collaborative learning, strengthening the linkages between the various actors in the innovation system and facilitating the wide diffusion of knowledge. Therefore the government should influence not only the level of the RDI but the nature of innovative efforts as well.

A counter rationale for market and system failures is government failure. This occurs when government policy interventions may also lead to an inefficient allocation of resources.

In evaluating the justification of government interventions, the concept of ‘additionality’ has become influential. ‘Input additionality’ refers to the question of whether public expenditure has created additional funds and their uses (cf. ‘crowding out’ effects). ‘Output/outcome additionality’ is about the extent to which public expenditure has generated additional private and social returns. ‘Behavioural additionality’ focuses on the extent to which public expenditure has created sustainable effects beyond the immediate outputs/outcomes such as improving the knowledge, capabilities, organisation, networks and strategies of firms.

In a nutshell, the new strategy consists of the following elements:

• Growth and wellbeing from renewal
• Priority to growth-seeking, innovative SME’s
• Increased focus on forerunners and strategic innovations
• Customer success in global value networks
• Services and non-technical contents equally important as industry and technologies
• Tekes will play a more essential role in the innovation services cooperation network
• More customer-orientated and flexible approach

Tekes objectives in the new strategy have remained largely the same:

• Productivity and renewal: sustainable growth which requires increased productivity and renewal of the industrial life
• Wellbeing of humans and the environment: effective specific measures will be implemented to improve the wellbeing of humans and the environment
• Capabilities for innovation activities: more skills that can be utilised and enhanced in research and innovation networks
• Tekes of the future: an inspiring, influential and responsible actor

Together with its customers, partners and stakeholders, Tekes has identified six focus areas. Tekes intends to allocate the majority of research project funding to universities and research institutions based on these focus areas. The focus areas are also reflected
in Tekes programmes and the selections of strategic new research. The SHOK research programmes also cover a part of Tekes focus areas. Tekes aims to direct roughly 50% of its funding to focus areas. Tekes focus areas are: (1) Natural resources and sustainable economy; (2) Vitality of people; (3) Intelligent environments; (4) Business in global value networks; (5) Value creation based on service solutions and intangible assets and (6) Renewing services and production by digital means.

In summary, the most important new elements in the new Tekes strategy are:

- Focus on forerunners which will lead to less projects being funded and increased funding for individual projects
- Increased funding for young companies will lead to higher risks for Tekes, i.e. greater benefits as well as more failures
- Services and industries as well as technological and intangible development will be equally important
- International cooperation as a cross-cutting goal – Tekes funds the internationalisation of R&D and innovation and the planning phase of the globalisation of business activities
- More flexible funding for innovative experiments will bolster the role of users and speed up the take-up of research outcomes
- Customer-driven value network projects and programmes will underline the focus on customers and demand
- Novel operating models in public research will generate new business activities and areas of expertise crucial for Finland

### Missions and strategies of benchmark agencies

**Vinnova's** mission is to promote sustainable growth by developing effective innovation systems and funding problem-orientated research. As a response to the globalisation of knowledge, technology and capital flows, Vinnova is moving towards a challenge-driven strategy. The strategy is focused on four societal challenges, which drive the development of innovations with international potential.

**Enterprise Ireland's** mission is to accelerate the development of world-class Irish companies to achieve strong positions in global markets resulting in increased national and regional prosperity. Its strategy is driven by the principle that growth in global markets through the internationalisation of Irish companies is the key to wealth and employment creation in Ireland.

The mission of **NL Agency** is the excellent implementation of international business, innovation and sustainability policy. NL Agency aims to implement government policy quickly, properly and effectively. In comparison with Tekes as well as Vinnova and Enterprise Ireland, NL Agency is the least involved in policy and programme design and is positioned primarily as an efficient policy delivery organisation which works for various ministries as well as other principals.
2 Tekes activities and customers

Tekes offers services and funding for its customers. Funding is targeted for research and innovation projects and especially for innovation cooperation between various organisations. In the period 2008–2010 Tekes project funding increased from ca. €480 million to €633 million (+32%). The total funding shows an upward trend until 2010 but in 2011 the funding stabilises and then decreases in 2012.

Tekes activities can be analysed in terms of reactive versus proactive modes of operation and in terms of support for companies and research organisations.

2.1 Tekes activities in terms of reactive versus proactive modes of operation

Tekes has two main modes of operation: reactive and proactive. The reactive mode concerns funding for customer-based need-driven initiatives. This bottom-up mode is open to applicants from all sectors/technology domains. The proactive mode, on the other hand, concerns specific policy measures that are targeted at strategic focus areas, which are defined together with customers and partners. The proactive mode includes Tekes programmes, SHOKs and other small-scale strategic initiatives that address specific needs of different customer groups. These specific programmes and initiatives are described below.

2.1.1 Tekes programmes

Tekes programmes target strategically important areas of R&D or themes that Tekes has identified together with the business sector and researchers. They consist of multiple projects and are implemented in cooperation with companies and research units. The projects are partly coordinated by companies and partly by research groups from a university or public research institute.

Tekes generally finances about half of the project costs. The other half comes from the participating businesses and research units. Eligible for funding are organisations that are based and registered in Finland (including international companies that operate in Finland). A programme lasts 4–6 years.

Tekes programmes typically organise annual or bi-annual targeted calls for universities and public research institutes to apply for them. Tekes experts evaluate the proposals. Businesses can send in applications at any time and they can participate through their own projects or by taking part in joint research projects. The company funding is also based on competitive funding. Tekes evaluates the applications and decides on the funding after discussions with the applicant. The results of company projects that belong to a Tekes programme are partly public,
which should stimulate the networking of companies and research units. Tekes programmes usually emphasise the participation by SMEs and promote cooperation with major companies and public research institutes.

The programmes not only offer funding but also services that support companies’ business, such as models for defining shared visions, seminars, training programmes and international visits together with liaison aimed at facilitating researcher exchange.

According to the strategy published in early 2011, Tekes programmes will be developed along two lines. Some will target the long-term development of skills of anticipated future importance, stressing public research. The needs of SMEs will be catered for through a separate and particularly agile model of programme activities.

Most R&D projects funded through Tekes programmes involve international R&D cooperation. Tekes can offer funding to the Finnish counterparts in joint projects, finance researcher mobility to and from Finland, to facilitate the exchange of information and cross-border networking.

### 2.1.2 SHOK programmes

From 2008 onwards Strategic Centres for Science, Technology and Innovation (SHOKs) were set up, replacing to some extent the Tekes programmes. SHOKs are public-private partnerships in which companies and universities are cooperating to speed up innovation processes. In these SHOKs the participating companies and universities/public research organisations, based on sector themes, jointly define the research agenda. The SHOKs are multidisciplinary and involve different sectors of industry and society. Their main goal is to thoroughly renew industry clusters and to create radical innovations. Excellent scientific research that meets the needs of Finnish industry and society within a five-to-ten-year period is at the core of the SHOKs. The SHOKs also aim to be gateways to international cooperation.

Six centres are in operation: Energy and the environment (CLEEN Ltd.), Metal products and mechanical engineering (FIMECC Ltd.), Forest industries (Forestcluster Ltd.), Built environment (RYM Ltd.), Health and wellbeing (SalWe Ltd.) and ICT industry and services (TIVIT Oy).

Each Centre consists of the coordinating function in the form of a non-profit limited company jointly owned by the shareholders and a virtual research organisation. The company’s shareholders include relevant companies, universities and research institutions.

Within each Strategic Centre, some €40-60 million annually are invested in research. Tekes is responsible for the public funding of the SHOKs and makes funding decisions on projects and programmes proposed by the SHOKs.
2.1.3 Other strategic initiatives

These initiatives aim to encourage SMEs to increase their RDI activities in a specific field. Currently, there are initiatives promoting, for example, diagnostics cooperation between Finland and India, development of new media solutions, green ICT and transportation.

2.2 Tekes activities in terms of types of beneficiaries

Tekes services and funding target two main categories of customers: companies and research organisations.

2.2.1 Tekes funding and services for companies

Tekes funding for companies occurs via:

- R&D funding for companies, both in the reactive and proactive modes
- Aid for young innovative enterprises
- De minimis grant

Tekes provides funding for technological RDI as well as for work place innovations, either as part of R&D funding or as part of the De minimis grant. In addition, Tekes provides funding to help SMEs purchase innovation services.

2.2.1.1 R&D FUNDING FOR COMPANIES

Companies based in Finland are eligible for funding for projects that aim to develop products, services, production methods or business concepts. As part of an R&D project, a company may also develop its skills and workplace operating methods. Tekes funding can also be used for the implementation of pilot projects and for testing environments needed for development.

Tekes experts assess the applications and look at the project, targeted business activities and the enterprise as a whole. They assess the market need, novelty value, competitive situation and customer benefits of the innovation proposed as well as the effectiveness of Tekes funding.

Tekes funds part of the project’s costs, depending on the novelty value of the innovation and the period before anticipated commercialisation. Grants for SMEs typically cover 35% or 50% of project costs, while loans for SMEs cover 70%. Loans are used for projects that result in a marketable product or service or a new business.
concept. They are risk-loans granted without a security. The funding can also be
granted as a combination of a loan and a grant.\footnote{4}

In the case of large enterprises, the share of funding provided by Tekes depends
on the research-intensiveness and novelty value of the project and the extent of
cooperation. Funding granted for the projects of large enterprises may cover 25%,
35% or 50% of the costs, depending on the nature of the project.\footnote{5}

### 2.2.1.2 AID FOR YOUNG INNOVATIVE COMPANIES (YIC)

Tekes offers support for Young Innovative Companies (YICs) to stimulate fast
international growth. Eligible companies are on the threshold of fast international
growth and have products, solutions or services with sustainable competitive
advantage and high market potential. They should also have a credible growth plan
and a committed and experienced management team. They must not be older than
six years, small in size and invest significantly in R&D – the R&D investments should
be at a minimum of 15% of its turnover. Tekes experts and a panel consisting of third-
party finance sector experts assess the companies.

The funding is phased as follows:

- The aim of the first phase of funding is to get the company on a growth path and
to demonstrate the company’s competitiveness on the international market.
  Companies approved for the first phase have often been operating for a few
  years and have demonstrated their business concept by already attracting
  customers. Funding is typically around €250,000.
- The aim of the second phase of funding is to accelerate and enhance the growth
  and internationalisation of the company’s operations. The total funding for the
  first and second phase is maximum €1 million per company (in areas eligible
  for regional aid max. €1.25 million). Funding covers a max. 75% of all operating
costs.

Funding for YICs was introduced in 2008. At the end of 2010, the number of companies
covered by this type of funding was 71, with a total of €33 million allocated to them.
The majority of these companies operated in the ICT sector but companies in the

\footnote{4} The maximum funding for SMEs as % of the project cost depends on the nature of the project:
- International joint projects and their preparation: a grant of max. 65%
- Research-intensive and challenging development projects: a grant of max. 50%
- Challenging development projects of products, business operations, methods and services: a grant of max. 35%, a loan of max. 70%, or a combination of a grant of max. 25% and a loan of max. 25%
- Productisation, pilots, demonstrations, test production and validation: a loan of max. 70%
- Aid for innovation advisory services: a grant of max. 75%
- Work organisation development: a grant of max. 50%


\footnote{5} The maximum funding for large enterprises/groups as % of development project costs depends on the nature of the project and the size of the large company (<2000 or >2000 employees):
- Research-intensive, long-term, challenging development projects involving a large network: a grant of 50% (specific conditions apply depending on the size of the company)
- Actual international joint projects: a grant of max. 50% (35% for companies >2000 employees; specific conditions apply depending on the size of the company)
- Challenging projects to develop products, business operations, methods and services: a grant of max. 35% (25% for companies >2000 employees)
- Project preparation and preliminary studies: a grant of max. 50%

energy and environment sector and the field of biomedicine were also funded. No sector was ineligible for funding.\(^6\)

In addition to funding YICs, Tekes promotes the development of potential growth companies through the Vigo Start-up Accelerator programme that was launched together with the Ministry of Employment and the Economy. Tekes and Finnvera’s Seed Fund Vera are investing a total of around €45 million in the three-year programme. In 2010, six accelerators were involved in the Vigo programme. Of the companies the Vigo accelerators worked with, 22 had received Tekes funding.\(^7\)

### 2.2.1.3 DE MINIMIS GRANT

The De minimis grant provides flexible financing for SMEs for starting up systematic RDI activity. SMEs can receive 50% of the eligible costs, up to €100,000 per project. In 2010 Tekes spent €14.5 million for 203 projects.

### 2.2.1.4 WORK ORGANISATION DEVELOPMENT

Tekes stimulates work place innovations\(^8\) in Finnish SMEs, large enterprises, public organisations and associations. Targets for development may include: work processes, work organisation, working methods, functional networking inside and outside the workplace, employee-involving forms of development and innovation activity, supervisory work, knowledge management and human resources development, performance evaluation systems, reward systems and/or working time systems.

Criteria for funding are that work organisation development projects must:

1. Improve productivity and the quality of working life in the workplace
2. Be innovative
3. Be implemented in cooperation with the management and staff

Funding for work organisation development projects may be granted as part of Tekes R&D funding or de minimis type funding. It helps to cover the work inputs of external and in-house experts during the project.

It is possible to combine work organisation development with a more extensive R&D project focusing on technology and business operations:

- If the share of work organisation development is at least one half of the project, funding may be granted as a de minimis grant both to enterprises and other organisations. The maximum grant is €100,000. The funding covers 35% to 50% of eligible cost, depending on the degree of novelty.\(^9\)

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\(^6\) Source: Tekes Annual review 2010.

\(^7\) Source: Tekes Annual review 2010.

\(^8\) Work place innovations refer to changes jointly implemented by management and staff in the work, organisation and management practices of the workplace. They must result in measurable improvements in productivity (operational performance) and quality of working life. (http://www.tekes.fi/en/community/Funding_for_work_organisation_development/1154/Funding_for_work_organisation_development/2527).

\(^9\) The funding covers no more than 35% of the eligible costs if the project offers significant novelty value for the applicant only. If the project has more extensive novelty value and is replicable at other workplaces, the maximum amount of funding may be 50% of eligible total costs. In that case, the project implementation plan must elaborate on the possibilities of utilising the outcomes more extensively. In enterprises with more than 500 employees, funding may only be granted for projects with at least national novelty value and replicability, if the enterprise undertakes to openly disseminate the results for example through seminars or publications.
• When the share of work organisation development is less than one half of the project, funding for the entire project is granted as Tekes R&D funding. The funding may amount to 25–65% of total costs. There is no maximum limit for the grant. Applications for work organisation development funding can be submitted at any time.

2.2.1.5 EXPERT AND INNOVATION SERVICES FOR SMES
Tekes provides funding to help SMEs to purchase innovation services. Firms can receive up to 75% of the costs of innovation services bought from outside experts with a maximum of €200,000 per company in a three year period. Tekes spent €1.1 million in 2010 for 34 projects.

Tekes also offers innovation capabilities’ analysis for SMEs. 300-400 new customers use this service each year. Furthermore, Tekes offers expert advice on RDI activities and the national innovation support system to all active customers. Finally, Tekes has programme-specific expert services to support networking, internationalisation, innovation and business operations. These services amount to 50-60 different expert services and are delivered to more than 3,000 customers annually.

2.2.2 Funding for research organisations
Tekes funds research organisations to perform research in technology, services, business and working life with significant novelty value. These projects should combine excellent research with already a good vision on commercialisation or valorisation. Project results are public. Potential users are usually involved in the preparation and implementation of these projects. The level of third-party funding available for the project and the willingness of funding providers to be involved in the project steering group are indications of the interest of these parties in the project. Tekes prioritises large projects involving international and multidisciplinary cooperation.

All organisations engaged in public research are eligible for funding. These mainly include state research institutes, universities and polytechnics.

Projects are evaluated in competitions based on general criteria defined by the Tekes mission. Tekes experts will compare the projects by considering the field of research in Finland and abroad. Project plans may include international networking activities aiming at further projects. Funding levels vary between 60% and 70% of

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10 Public research is defined as (a) research carried out by research organisations which aims at raising the general level of knowledge and the results of which are widely published; (b) independent development activities of research organisations (including the development of a scientific instrument, operating method or technique) to increase knowledge and improve understanding; (c) preparation for the commercialisation of research outcomes.

11 In line with the Community framework for state aid for research and development and innovation, a research organisation means an entity, such as a university or a research institute, irrespective of its legal status or way of financing. The primary goal of the organisation is to conduct fundamental research, industrial research or experimental development and to disseminate their results by way of teaching, publication or technology transfer. Potential profits are reinvested in research activities, dissemination of results or teaching.

12 Winning projects are ones that (a) Enhance sustainable competitiveness; (b) Help to commercialise research outcomes; (c) Promote the generation of new business; (d) Encourage the internationalisation of research; (e) Create networks of actors; and (f) Intensify research into the quality of working life.
eligible costs, depending on size/ambition and international scope of the project. Project funding from third-parties is typically required and varies from \(>10\%\) to \(>25\%\) + other inputs, depending on the nature of the project.

### 2.2.2.1 FIDIPRO PROGRAMME

Together with the Academy of Finland, Tekes implements the FiDiPro guest researcher programme. FiDiPro - the Finland Distinguished Professor Programme provides Finnish universities and research institutes with the opportunity to employ distinguished professor-level scientists from all around the world for a fixed term to carry out research and contribute to the advancement of scientific research. FiDiPro Fellow funding is designed to help talented international researchers past their postdoctoral stage. Expatriate Finnish scientists who have long worked outside Finland are also eligible for FiDiPro programmes. Finnish universities and research institutes may propose FiDiPro Professors and FiDiPro Fellows from all disciplines. Both Tekes and the Academy of Finland provide funding for FiDiPro Professors. Only Tekes provides funding for FiDiPro Fellows.

### 2.2.2.2 ERDF FUNDING FOR PUBLIC RESEARCH PROJECTS VIA TEKES

In addition to national sources of funding, Tekes also grants ERDF funding for public research projects. The same evaluation criteria apply to ERDF applications as to national applications addressed to Tekes. In project evaluations, it is possible to prioritise applications and the introduction of technological projects. ERDF projects must meet the following criteria:

- Tekes national funding criteria
- Objectives and criteria of the Structural Funds programme, under which project contents must serve the Structural Funds objectives of the regions from which the applications are submitted
- The project must fit in with the strategies of the Centre for Business Development, Transport and the Environment and the province.

ERDF funding may also be granted for a joint research project initiated by several parties. Joint projects are implemented as parallel projects. Funding levels vary between 90\% and 100\% of eligible costs and project funding from third-parties may be required (up to \(>10\%\)), depending on the nature of the project. Applications for ERDF funding can be submitted during all Tekes application rounds for public research funding and ERDF application rounds of the provinces.

### 2.2.3 Research funding under the new strategy

Recently, funding for research organisations was reformed. Tekes now focuses on:

- **Public research networked with businesses**: developing expertise and solutions to identified business needs in cooperation with enterprises. Projects
are selected through calls for proposals launched by Tekes programmes. In general, 10% of co-funding from companies that potentially utilise the results is required. (Tekes may adjust this requirement (up/down) when launching a call for research proposals). The level of commitment of companies will be evaluated through: cooperation during the preparation of the project proposal; participation and interaction in the project’s steering group; co-funding (or other contribution) provided to the project by third parties and the scope of the companies’ parallel development projects.

- **New knowledge and business from research ideas**: research projects to elaborate an idea and prepare its commercialisation. Research should produce significant new knowledge and expertise relevant to the utilisation of the research idea. Alongside this, the commercialisation of the research results should be prepared. At least 30% of the project budget must be allocated to prepare commercialisation as a new objective of existing companies, or through a start-up company. An external commercialisation expert must be a member of the project team. Funding is given in 2 to 3 intervals, each 1 to 2 years, with a go/no-go interim evaluation.

- **Strategic research openings**: projects to generate excellence in competence areas that are anticipated to be essential for businesses in the future. Tekes provides funding for ‘small strategic research openings’ through a one-time grant (max. €350,000 for 2 years). These may evolve into ‘large strategic research openings’ for which funding is granted in periods, with regular interim evaluations. Duration is typically 5 to 10 years. Projects should offer a bold new opening with a perspective that connects things in a new way. Key researchers must have a vision of the future competence needs and about the significance of those competences to the renewal of industries. International cooperation and broad multidisciplinary execution will raise the level of funding and they may become preconditions for the continuation of funding as the project progresses. No third-party co-funding is required. Tekes shall specify the topics and themes in each call for proposals (three calls annually with varying topics).

- **Finland Distinguished Professor Programme**: Attracting top-notch international researchers to Finland. (See section 2.2.2.1).

In addition, there are various options for international cooperation in research projects funded by Tekes.

- **Mobility**: Costs related to inward and outward researcher mobility are approved, if mobility contributes to achieving the project’s goals. The level of funding may be raised by 10% per unit (60% → 70%) in case that amount of mobility is at least 2 years per person.

- **International joint research projects**: Tekes finances the participation of a Finnish research organisation in an international joint research project

- **Ownership of IPRs** is negotiated directly between Finnish the research organisation and its international partner
Activities of benchmark agencies

An important part of Vinnova’s activities consists of increasing the cooperation between companies, universities, research institutes and other organisations in the Swedish innovation system. This is done in various ways, including long-term investment in strong research and innovation milieus, investment in projects to increase the commercialisation of research results and by creating catalytic meeting places in the form of conferences and seminars.

Enterprise Ireland (EI) offers a broad range of support and services to ‘High Potential Start-Up’ companies which are active in international markets as well as researchers in Higher Education Institutes (for the commercialisation of research results). In addition to a range of funding initiatives, EI offers export assistance, support to develop competitiveness, incentives to stimulate in-company R&D, assistance with R&D collaboration and connections and introductions to customers overseas.

NL Agency offers support and services to various clients, including SMEs, knowledge institutes, municipalities and individual citizens. The portfolio of policy measures that is delivered to these clients depends on the contracts NL Agency negotiates with its principals and goes well beyond R&D, innovation and entrepreneurship support. They are grouped around four types of activities: providing information and advice; funding; networking and implementing laws and regulations.

2.3 Analysis of Tekes funding

2.3.1 Trends in Tekes funding

Figure 1 shows the trends in Tekes funding for the different funding channels. Need-driven ‘reactive funding’ has become more prominent. Its share increased from ca. 30% in 2008 to 40% in 2012 of Tekes total funding. Proactive funding decreased accordingly. The funding of the Tekes programmes shows a declining trend, dropping to 40% in the period 2008–2012. While in 2008 more than half of Tekes expenditure was on Tekes programmes, in 2012 it is no more than 25%. A large part of this decline is caused by the replacement of some Tekes programmes by SHOKs. In terms of share of Tekes total funding, the SHOKs grow from 0% in 2008 to 20% in the period 2008–2012. The expenditure on ‘proactive small-scale initiatives’ increased slightly in the years 2008-2010 but remained rather stable in 2011 and 2012 with ca. 15% of Tekes total funding.
Figure 1. Tekes funding, breakdown by funding channel

![Tekes funding, breakdown by funding channel](image)

Source: Tekes presentation “General information for evaluators”. Note that the figures include €20-30 million funding from EU Structural Funds, annually.

The figures for 2010 are given in Figure 2. It shows that the Tekes programmes and the SHOKs together take up more than half of the available budget.

Figure 2. Tekes funding to programmes, 2010

<table>
<thead>
<tr>
<th>Target</th>
<th>€ million</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tekes programmes</td>
<td>228</td>
<td>36%</td>
</tr>
<tr>
<td>SHOKs</td>
<td>99</td>
<td>16%</td>
</tr>
<tr>
<td>Other, outside programmes</td>
<td>306</td>
<td>48%</td>
</tr>
<tr>
<td>(non-thematic)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>633</td>
<td>100%</td>
</tr>
</tbody>
</table>


2.3.2 Tekes funding and services per customer type

Figure 3 represents the distribution of Tekes customers by organisation type in the period 2007–2011. The vast majority of its customers (93%) are companies. Most of the other organisation types are represented by less than 100 organisations. Tekes programmes over the last 5 years involved (apart from companies): 99 Associations, 65 Cities (and 24 other Municipalities), 43 Start-ups, 32 Foundations, 24 Universities (incl. polytechnics) and 21 State-owned Research Institutes.
### Figure 3. Distribution of Tekes customers by organisation type (2007-2011)

<table>
<thead>
<tr>
<th>Organisation type</th>
<th>Number of customers</th>
<th>Share</th>
<th>Organisation type</th>
<th>Number of customers</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>5,044</td>
<td>92.7%</td>
<td>University of applied sciences, municipality</td>
<td>19</td>
<td>0.3%</td>
</tr>
<tr>
<td>Association</td>
<td>99</td>
<td>1.8%</td>
<td>Municipality, health care</td>
<td>18</td>
<td>0.3%</td>
</tr>
<tr>
<td>City/municipality</td>
<td>65</td>
<td>1.2%</td>
<td>Other state organisation</td>
<td>15</td>
<td>0.3%</td>
</tr>
<tr>
<td>Start-up company (no business id)</td>
<td>43</td>
<td>0.8%</td>
<td>University of applied sciences, private</td>
<td>14</td>
<td>0.3%</td>
</tr>
<tr>
<td>Foundation</td>
<td>32</td>
<td>0.6%</td>
<td>Society</td>
<td>3</td>
<td>0.1%</td>
</tr>
<tr>
<td>University</td>
<td>24</td>
<td>0.4%</td>
<td>State owned commercial enterprise</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>State owned research institute</td>
<td>21</td>
<td>0.4%</td>
<td>Non-Finnish organisation</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Municipality, other</td>
<td>20</td>
<td>0.4%</td>
<td>Research Institute</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td>Cooperation</td>
<td>20</td>
<td>0.4%</td>
<td>Community</td>
<td>1</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,441</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: TEKES customer database, 2012

Funding data by organisation type shows that companies receive the highest amount of funding (€1.7 billion over the last 5 years), followed by universities (€0.56 billion) and the state owned research institutes (€302 million). Societies, corporations (consortia), universities and state owned research institutes receive an above average funding per participation (above €290,000).

Figure 4 represents the distribution of Tekes funding to companies and research organisations for 2010. 60% of the funding was allocated to business projects.

### Figure 4. Tekes funding to companies and research organisations, 2010

<table>
<thead>
<tr>
<th>Target</th>
<th>€ million</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding for business projects</td>
<td>382</td>
<td>60%</td>
</tr>
<tr>
<td>Targeted at SMEs</td>
<td>233</td>
<td></td>
</tr>
<tr>
<td>Target at small companies &lt; 6 years old</td>
<td>104</td>
<td></td>
</tr>
<tr>
<td>Funding for projects launched by research organisations (including €29m ERDF funding via Tekes)</td>
<td>251</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>633</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>


Combined company size and funding data is only available for 75% of all participations. The distribution of funding by company size is presented in Figure 5. It shows that the least populated group of participants (large companies) receives the largest amount of Tekes funding, followed by micro-enterprises, which receive about 26% of all Tekes funding for which we have data available.
**Figure 5.** Distribution of Tekes funding by size of organisation

**Figure 6.** Customer profile by size – funding per participation

<table>
<thead>
<tr>
<th>Size (Number of employees)</th>
<th>Funding € million</th>
<th>Share of funding</th>
<th>Number of organisations</th>
<th>Average funding per participation (k €)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro (0-9)</td>
<td>545.4</td>
<td>31%</td>
<td>1,657</td>
<td>231</td>
</tr>
<tr>
<td>Small (10-49)</td>
<td>452.4</td>
<td>26%</td>
<td>1,188</td>
<td>227</td>
</tr>
<tr>
<td>Medium sized (50-249)</td>
<td>144.3</td>
<td>8%</td>
<td>394</td>
<td>227</td>
</tr>
<tr>
<td>Large (250-1999)</td>
<td>264.0</td>
<td>15%</td>
<td>481</td>
<td>287</td>
</tr>
<tr>
<td>Very large (2000+)</td>
<td>358.7</td>
<td>20%</td>
<td>171</td>
<td>485</td>
</tr>
<tr>
<td>Total</td>
<td>1,764.8</td>
<td>100%</td>
<td>3,891</td>
<td>265</td>
</tr>
</tbody>
</table>

Source: TEKES customer database, 2012 (excluding universities and research institutes)

In the period 2007–2010, the large and very large companies have seen a reduction in their total share of funding from 46% in 2007 to 24% in 2010. Micro companies, on the other hand, have seen a steady increase in the share of funding they receive from Tekes: from 16% in 2007 to 25% in 2009 and 46% in 2010. In 2011 the pattern from 2007–2010 has been reversed but this could be caused by incomplete data for that year. Nevertheless, in 2011 funding for micro companies was also higher than in 2007 and funding for large and extra large companies was lower.
2.3.3 Tekes customers by number of projects in which they participated

In terms of the level of involvement in Tekes projects, almost two thirds (65%) of all customers (excluding research institutes and universities) were involved in only one project in the period 2007–2011. Almost a third were involved in 2–5 projects, 2.3% involved in 6 to 10 projects and only 0.8% of all customers participated in more than 10 projects. Research institutes and universities however predominantly participated in more than 10 projects. The full distribution is shown in Figure 7.

Figure 7. Distribution of Tekes customers by number of projects in which they participated

<table>
<thead>
<tr>
<th>Level of involvement in Tekes projects</th>
<th>Number of customers (universities and research institutes)</th>
<th>Number of customers (other Tekes clients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One project</td>
<td>7</td>
<td>3,492</td>
</tr>
<tr>
<td>2 to 5</td>
<td>24</td>
<td>1,711</td>
</tr>
<tr>
<td>6 to 10</td>
<td>4</td>
<td>124</td>
</tr>
<tr>
<td>11 to 25</td>
<td>19</td>
<td>36</td>
</tr>
<tr>
<td>26 to 50</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>51 to 100</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>More than 100</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>79</td>
<td>5,372</td>
</tr>
</tbody>
</table>

Source: TEKES customer database, 2012

2.3.4 Tekes customers by sector

While SHOKs address specific sectors, most of Tekes programmes target either specific sectors or specific technologies (often related to specific sectors). It is, however, not easy to analyse the effect of this programming on the Tekes customer portfolio. In the last 5 years, 25 Tekes programmes started in all kinds of areas and on top of this, the reactive financing does not target specific sectors.

The distribution over business areas of the customers participating in Tekes programmes is represented in Figure 8. According to the number of participations the largest business area is Software and Digital Media followed by Telecommunications and Electronics Industries and Mechanical Engineering. In terms of funding received by Tekes customers, the largest business area is Telecommunications and Electronics Industries, followed this time by the Mechanical Engineering Industry.
## Figure 8. Distribution of Tekes customers by Business area

<table>
<thead>
<tr>
<th>Tekes Business area</th>
<th>No. of customers (Share)</th>
<th>No. of participations (Share)</th>
<th>Tekes funding in € million (Share)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecommunications and Electronics Industries</td>
<td>512 (10%)</td>
<td>1,017 (16%)</td>
<td>€389.1 (22%)</td>
</tr>
<tr>
<td>Software and Digital Media Industries</td>
<td>1,062 (21%)</td>
<td>1,286 (20%)</td>
<td>€222.6 (13%)</td>
</tr>
<tr>
<td>Forest and Chemical Industries</td>
<td>260 (5%)</td>
<td>408 (6%)</td>
<td>€207.6 (12%)</td>
</tr>
<tr>
<td>Mechanical Engineering Industry</td>
<td>927 (18%)</td>
<td>1,117 (17%)</td>
<td>€290.4 (17%)</td>
</tr>
<tr>
<td>Real Estate and Construction Industries</td>
<td>669 (13%)</td>
<td>752 (12%)</td>
<td>€152.7 (9%)</td>
</tr>
<tr>
<td>Energy and Environment Industries</td>
<td>432 (9%)</td>
<td>530 (8%)</td>
<td>€200.9 (12%)</td>
</tr>
<tr>
<td>Services and Wellbeing Industries</td>
<td>872 (17%)</td>
<td>864 (13%)</td>
<td>€119.9 (7%)</td>
</tr>
<tr>
<td>Life Science Industries</td>
<td>329 (6%)</td>
<td>476 (7%)</td>
<td>€153.6 (9%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5,063 (100%)</td>
<td>6,450 (100%)</td>
<td>€1,736.8 (100%)</td>
</tr>
</tbody>
</table>

* Does not include 275 customers whose business area was not identified.

Source: TEKES customer database, 2012 (excluding universities and research institutes)

Based on this data, the area with the highest funding per participation is in the Forest and Chemical Industries (€509k), followed by the Telecommunications and Electronics Industries (€383k) and the Energy and Environment Industries (€379k).

The Tekes database also includes an indication of specific branches (or sectors) in which the customers mainly operate. The highest number of Tekes customers (26%) are from the manufacturing sector, followed by ICT (22%), professional, scientific and technical activities (20%), wholesale and retail trade and repair of motor vehicles and motorcycles (8%). All other sectors were represented by less than 5% of customers.13

Figure 9 compares the number of Tekes funded companies by industrial branch to an overall profile of companies in Finland based on Statistics Finland’s national data.

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13 Within manufacturing, 70% of all customers are involved in the manufacture of chemicals and chemical products, 18% in the manufacture of food products and 12% in the manufacture of other transport equipment.

91% of all ICT customers are active in programming and broadcasting, and only 9% in publishing. In professional services the main activities are activities of head offices and management consultancy activities (96%).

In administrative and support service activities, there is a rather even distribution between rental and leasing activities (52%) and security and investigation activities (48%).

In transportation and storage: water transport 68%, land transport and transport via pipelines 32%.

In agriculture, forestry and fishing is the most frequent main activity, then crop and animal production, hunting and related services (72%); followed by forestry and logging (16%) and fishing and aquaculture (12%).
### Figure 9. Tekes funded companies during 2007-2011 compared to all companies in Finland, by industrial branch

<table>
<thead>
<tr>
<th>Count of Branch Code Level 1</th>
<th>Number of Tekes funded companies during 2007-2011 period</th>
<th>Proportion of all Finish companies (2010 figures) supported by Tekes</th>
</tr>
</thead>
<tbody>
<tr>
<td>J Information and communication</td>
<td>1,169</td>
<td>18.80%</td>
</tr>
<tr>
<td>C Manufacturing</td>
<td>1,426</td>
<td>11.20%</td>
</tr>
<tr>
<td>E Water supply, sewage and waste management, waste management and remediation activities</td>
<td>38</td>
<td>6.80%</td>
</tr>
<tr>
<td>B Mining and quarrying</td>
<td>27</td>
<td>6.60%</td>
</tr>
<tr>
<td>M Professional, scientific and technical activities</td>
<td>1,035</td>
<td>5.60%</td>
</tr>
<tr>
<td>D Electricity, gas and hot water supply, cooling business</td>
<td>24</td>
<td>3.80%</td>
</tr>
<tr>
<td>P Education</td>
<td>44</td>
<td>3.20%</td>
</tr>
<tr>
<td>Q Human health and social</td>
<td>108</td>
<td>2.50%</td>
</tr>
<tr>
<td>R Arts, entertainment and recreation</td>
<td>48</td>
<td>2.30%</td>
</tr>
<tr>
<td>A Agriculture, Forestry and Fisheries</td>
<td>47</td>
<td>1.80%</td>
</tr>
<tr>
<td>N Administrative and support service activities</td>
<td>110</td>
<td>1.80%</td>
</tr>
<tr>
<td>G Wholesale and retail trade, motor vehicles and motorcycles</td>
<td>422</td>
<td>1.70%</td>
</tr>
<tr>
<td>K Financial and insurance activities</td>
<td>59</td>
<td>1.70%</td>
</tr>
<tr>
<td>S Other service activities</td>
<td>26</td>
<td>1.70%</td>
</tr>
<tr>
<td>F Construction</td>
<td>212</td>
<td>1.10%</td>
</tr>
<tr>
<td>H Transportation and storage</td>
<td>63</td>
<td>0.80%</td>
</tr>
<tr>
<td>I Accommodation and food service activities</td>
<td>31</td>
<td>0.60%</td>
</tr>
<tr>
<td>L Real estate activities</td>
<td>44</td>
<td>0.40%</td>
</tr>
<tr>
<td>Y Total *</td>
<td>5,044</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

* The total of Tekes customers includes 37 companies for which the industry branch was not known

Source: Tekes customer database (companies only), 2012 and Statistics Finland

The best covered branches of industry within the Tekes customer base over the last 5 years, relative to the size of the industrial branch, were Information and Communication, Manufacturing, Water supply, Sewage and Waste Management, Waste Management and Remediation activities; Mining and Quarrying and Professional, Scientific and Technical activities. All of these five industrial branches have between 5% and 20% of their companies supported by Tekes.

#### 2.3.5 Tekes customers by region

The distribution of Tekes customers by region is shown below in Figure 10. Almost half of the Tekes customers are from Uusimaa region (Helsinki and surroundings). Three other regions - Pirkanmaa (with Tampere), Pohjois-Pohjanmaa (Oulu) and Varsinais-Suomi (Turku) – had a relatively strong representation (with more than 6%).
### Figure 10. Distribution of Tekes customers by region

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of customers (between brackets: excl. universities and research organisations)</th>
<th>Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uusimaa</td>
<td>2429 (2,392)</td>
<td>45%</td>
</tr>
<tr>
<td>Pirkanmaa</td>
<td>519 (514)</td>
<td>10%</td>
</tr>
<tr>
<td>Pohjois-Pohjanmaa</td>
<td>389 (386)</td>
<td>7%</td>
</tr>
<tr>
<td>Varsinais-Suomi</td>
<td>386 (382)</td>
<td>7%</td>
</tr>
<tr>
<td>Pohjois-Savo</td>
<td>214 (209)</td>
<td>4%</td>
</tr>
<tr>
<td>Keski-Suomi</td>
<td>200 (198)</td>
<td>4%</td>
</tr>
<tr>
<td>Päijät-Häme</td>
<td>153 (152)</td>
<td>3%</td>
</tr>
<tr>
<td>Satakunta</td>
<td>150 (149)</td>
<td>3%</td>
</tr>
<tr>
<td>Etelä-Pohjanmaa</td>
<td>144 (143)</td>
<td>3%</td>
</tr>
<tr>
<td>Pohjois-Karjala</td>
<td>119 (117)</td>
<td>2%</td>
</tr>
<tr>
<td>Häme</td>
<td>113 (110)</td>
<td>2%</td>
</tr>
<tr>
<td>Pohjanmaa</td>
<td>112 (107)</td>
<td>2%</td>
</tr>
<tr>
<td>Etelä-Savo</td>
<td>104 (102)</td>
<td>2%</td>
</tr>
<tr>
<td>Lappi</td>
<td>98 (95)</td>
<td>2%</td>
</tr>
<tr>
<td>Kymenlaakso</td>
<td>84 (83)</td>
<td>2%</td>
</tr>
<tr>
<td>Etelä-Karjala</td>
<td>77 (74)</td>
<td>1%</td>
</tr>
<tr>
<td>Itä-Uusimaa</td>
<td>59 (59)</td>
<td>1%</td>
</tr>
<tr>
<td>Kainuu</td>
<td>52 (52)</td>
<td>1%</td>
</tr>
<tr>
<td>Keski-Pohjanmaa</td>
<td>47 (46)</td>
<td>1%</td>
</tr>
<tr>
<td>Ahvenanmaa</td>
<td>1 (1)</td>
<td>0%</td>
</tr>
<tr>
<td>Kanta-Häme</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Åland</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: TEKES customer database, 2012

The 10 most highly represented cities and municipalities within Tekes programmes over the last 5 years were: Helsinki, Espoo and Vantaa from Uusimaa region, Tampere from Pirkanmaa region, Oulu from Pohjois-Pohjanmaa region, Turku from Varsinais-Suomi region, Jyväskylä from Keski-Suomi region, Kuopio from Pohjois-Savo region, Lahti from Päijät-Häme region and Joensuu from Pohjois-Karjala region. These top ten 10 municipalities represent 62%.
3 Tekes relevance and quality

In order to act as a ‘quality’ service provider, Tekes needs to make relevant enterprises aware of its services and those services need to be relevant, useful, accessible, of a high quality and so on. In this section we present the feedback from Tekes customers on these qualities. Where appropriate, we compare these responses with feedback from companies that have sought Tekes funding in the recent past but without success (as communicated to us in the survey that we did as part of the evaluation). These ‘unsuccessful applicants’ form a control group, allowing feedback from Tekes customers to be compared and contrasted with feedback from non-customers.

3.1 Awareness of Tekes services

Tekes customers were asked to rate their organisation’s level of awareness of Tekes services and operations. The results reveal reasonably high levels of awareness among customers regarding most aspects of Tekes role and operations, including the types of support available, how to apply and (importantly) who to contact at Tekes if they have an enquiry (see Figure 11). In all these cases at least two thirds of Tekes customers described themselves as ‘quite or very’ aware and most of the remainder were somewhat aware.

Tekes customers rate themselves as being rather less aware of the role of other support agencies. No more than a third (32%) rated their own organisation as quite aware or better (only 7% were very aware) while almost the same proportion (29%) indicated that they had no or low awareness.

In order to access the right support it is vital that Tekes customers are fully informed not just about what Tekes can provide but also what other agencies can offer. These results indicate that there is room for improvement to raise the general level of awareness of customers about the full range of support services available from all relevant agencies, both public and private.
The more innovative organisations responding to our survey reported significantly higher levels of awareness of Tekes role, the types of support available, how to apply for support and the role of other support agencies, than did the less innovative respondents.

Unsuccessful applicants (non-customers) provided broadly similar ratings in relation to their awareness of Tekes support services, how to apply, whom to contact and the role of other support agencies. The only significant difference identified was that non-customers indicated lower levels of awareness of Tekes role than was the case for customers.

### 3.2 Relevance of Tekes services

Tekes customers were asked about the relevance of Tekes services to their own organisation. The results indicate that almost all (86%) of the customers responding to our survey rated ‘Funding for R&D projects’ as quite or very relevant and in fact almost two-thirds (61%) indicated that this form of support is very relevant to their organisation (see Figure 12). These results confirm the outcome of Tekes own anonymous customer satisfaction survey where companies that have received funding from Tekes ranked the usefulness of the funding as 4.5 on a scale of 1–5 (2011).

Most customers, however, rated the other services provided by Tekes as less relevant than project-based R&D funding support:

- SHOKs were rated as not relevant or of little relevance by 44% of Tekes customers and a further 27% rated the SHOKs as only moderately relevant. (This may be caused by the fact that SHOKs are in specific sectors only, so by definition not relevant for everyone).
• Young innovative enterprise funding was rated as of reasonably high (quite or very) relevance by almost half (46%) of the customers but a similar proportion (41%) rated this form of support as of low relevance
• Programme services (such as networking, seminars, etc.) were rated as of high relevance by just over a third of the customers (37%) and moderately relevant by a further third (35%). Just over a quarter (27%) considered these services as of no or little relevance
• Information and advisory services were rated as of high relevance by a third of the customers (33%) and of moderate relevance to a further third (36%). The remainder (31%) stated that these services are of little or no relevance, which is perhaps lower than might be hoped

Figure 12. Relevance of Tekes services to customers (n=977-984)

The more innovative organisations within our sample provided significantly higher ratings for the relevance of SHOKs than did the less innovative companies and also provided slightly higher ratings for the relevance of R&D projects and Young Innovative Enterprise funding. No significant differences were found in relation to the other two services.

Unsuccessful applicants (non-customers) rated Young Innovative Enterprise funding (YIEF) as of significantly higher relevance than Tekes existing customers and rated each of the other four forms of support as of lower relevance. This reveals that many of the unsuccessful applicants that have failed to receive support over recent years associate themselves more with YIEF than with the other forms of support, relative to the existing customer base of Tekes.

As mentioned above, the qualitative comments obtained through the surveys revealed a broad spread of (often diverging) opinions. However, the key points that can be distilled in relation to the relevance of the various types of services provided by Tekes are as follows:
There is a generally high level of positive appreciation for R&D project funding – the traditional mainstay of Tekes support portfolio. Some commentators indicated that the funding criteria and requirements for the share of own funding can be demanding for small companies and start-ups but otherwise the project-based support is seen to be highly relevant and highly valued among Tekes customers.

Some customers consider support and funding for projects that include large groups of participants, programme activities, networking etc. as resources spent in vain. In line with this opinion, it is suggested that funding should be targeted more on company-driven projects which allegedly lead more quickly to concrete results in the form of commercialised products/services/solutions etc.

Other but fewer commentators point out that projects bringing together companies and research bodies are still needed in future, with Tekes continued active role in networking considered to be rather important.

Some respondents stated that the SHOK instrument has some problems, particularly for SMEs that identify barriers to their participation. In this line of thinking, SHOKs are seen to have some significant entry barriers, projects are often too big and there are too many partners involved, etc. As a solution it is suggested that the amount of funding provided via SHOKs should be reduced and the resources used instead to target funding for smaller projects with lower administrative overheads.

Some customers would like to see Tekes funding activities that are closer (easier?) to market.

Greater support for internationalisation is also called for by some customers.

### 3.3 How accessible are Tekes services?

Tekes customers were asked about their level of success in obtaining the various support services provided by Tekes, where they have applied. The results are represented in Figure 13 and reveal that customers have been very successful (relative to other Tekes services) in obtaining funding support for R&D projects (69% of customers have been mostly or completely successful with their applications). By contrast, most customers applying for SHOK funding or for Young Innovative Enterprise Funding have been completely or mostly unsuccessful (58% and 60% respectively).

Tekes programme services and its information and advisory services occupy something of a ‘middle ground’ as regards customer success in obtaining these forms of support, with approximately a third of customers achieving high levels of success, a third being moderately successful and a third having little or no success. Certainly in the case of information and advisory services we would expect customers to access these relatively easily and it is unclear why customers feel that such services are rather difficult to access successfully.
The more innovative organisations in our sample reported higher levels of success in obtaining funding for R&D projects and in obtaining Young Innovative Enterprise funding, than was the case for the less innovative ones. No significant differences were found between these two groups regarding their success in accessing the other services.

3.4 What happens when applications for Tekes support are unsuccessful?

Tekes customers were asked about the extent to which they were able to proceed with their original plans in cases where applications for Tekes support had been unsuccessful. The responses are represented in Figure 14 and reveal that in the majority of cases customers are indeed able to proceed with their plans, at least to some extent. In almost half of the cases (48%) the idea was taken forward but over a longer timescale; in 40% of cases progress was made but with fewer resources than originally planned and in 23% of cases fewer partners and less external assistance could be involved (or a combination of these).
The data also reveals that in 18% of cases the ideas/plans were abandoned entirely and the customers were not able to proceed at all. Conversely, in 11% of cases the organisations proceeded anyway, implementing their plans fully but using their own resources, while in 6% of cases they proceeded (fully) but with support from another provider. In these latter cases the entities providing the support were private investments/angel funding/bank loans (~40%), ELY centres (~25%), the European Commission or other international sources (~10%). Finnvera, national Ministries, the Academy of Finland and the Foundation for Finnish Inventions made up the remaining 25% between them.

Unsuccessful applicants (non-customers) provided a broadly similar profile of responses concerning the ‘fate’ of their unsuccessful proposals. However, existing customers were significantly more likely than non-customers to be able to proceed fully with their (unsuccessful) project ideas and plans, using either their own resources or with support from another agency or funding source. Existing customers were also significantly more likely to be able to proceed to some extent with their plans but with some ‘compromises’ with regard to the timescale, resources and involvement of partners and other external support. Existing customers were also significantly less likely to have to abandon their plans entirely.

3.5 Are customers offered all of the forms of support they need?

Tekes customers were asked whether there are any forms of support that their organisation would benefit from but which are not currently available from Tekes or any other support provider. Just over a third (39%) of respondents stated that there are forms of support that they would benefit from but which are not readily available. These customers were asked to state the form of support required and
the responses indicated a fairly strong or clear need for Tekes (or other agencies) to provide better support for (i) internationalisation and working in international markets, (ii) marketing and sales and (iii) entering markets (particularly in the case of start-ups). Less commonly the need for additional assistance can be identified in relation to (i) patenting, (ii) networking (domestically and internationally) and (iii) product development work.

3.6 Quality of Tekes processes and procedures

Tekes customers were asked to indicate the extent to which Tekes has satisfactorily met their organisation’s expectations in relation to various aspects of their operations.

3.6.1 Pre-application stage

The first set of Tekes processes that customers were asked to comment on concerned the support provided to customers before they apply. The results obtained are shown in Figure 15 and reveal the following:

- Customers’ expectations have been met or exceeded in around 80% of cases as regards (i) the availability of information on what services are available and (ii) how to apply for support
- Tekes has performed relatively well in terms of providing ‘easy access’ to a named contact who can provide advice and support pre-application, with over 60% of customers stating that their expectations have been exceeded. Nonetheless, 15% of customers did not have their expectations met in this regard
- Tekes has performed relatively poorly in terms of providing effective signposting to other agencies in the event that the support sought is not available from Tekes. Here, 42% of customers indicated that Tekes had failed to meet their expectations, suggesting that more can and should be done to ensure that customers are effectively referred on to other support providers in cases where Tekes is unable to help
The more innovative customers within our sample were significantly more likely than the less innovative ones to state that Tekes has exceeded their expectations with regard to the availability of information, the support available, how to apply and also in relation to Tekes signposting to other agencies.

Tekes customers were found to be significantly more likely than unsuccessful applicants (non-customers) to assign positive ratings regarding the availability of information and ease of access to a named Tekes contact. Non-customers provided broadly similar ratings (to customers) for the effectiveness of Tekes signposting to other agencies in the event that the support required was not available.

Qualitative suggestions for improvement in relation to the ‘pre-application’ stage related mainly to the need for Tekes to improve its communications concerning the support services that are available. Responses suggest that the service and funding portfolio is rather complex and there is a need for ways to make the information more comprehensible (e.g. through communication material, etc.)

### 3.7 Application, appraisal and selection stage

Customers were next asked for feedback on Tekes application processes and its procedures for appraising and selecting projects for funding. The results obtained are represented in Figure 16 and show something of a ‘mixed’ response. A relatively high proportion of customers (77%) have had their expectations met or surpassed in terms of the clarity and structure of Tekes application processes and the quality

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14 It is indeed the case that the ‘five’ forms of support used in our survey are not a clearly stated and established set of services that Tekes advertises consistently to prospective customers but rather a ‘simplified’ set worked out between the study team and Tekes. On the one hand Tekes appears to work in a way that invites companies in to discuss their needs and then aims to link them to the most appropriate forms of support available, which makes the service portfolio rather unclear from the outside. On the other hand, offering a very standardised product portfolio that is clear to companies but rather ‘inflexible’ might make the offerings clearer but might necessitate a more ‘hands off’ approach that would be seen to be less flexible and less optimised to individual company needs. The way forward is not clear but some effort should be made to clarify the kinds of help available.
of the appraisal and selection procedures employed by Tekes also meet or surpass customers’ expectations in most cases (71%).

A reasonably high proportion of customers, however, stated that their expectations had not been met, particularly with regard to the timeliness of the decision-making processes (34%) and the level of administrative burden associated with applying for funding (41%). While in both cases the majority of customers have had their expectations met or exceeded, the proportion of ‘dissatisfied’ customers was higher for these aspects than for most other aspects of Tekes procedures.

**Figure 16.** Extent to which Tekes meets customer expectations – application and selection process (n=932-934)

In all cases Tekes customers provided more positive ratings for Tekes application and selection processes than did non-customers (unsuccessful applicants). This is probably to be expected, given that those processes ‘favoured’ successful applicants over unsuccessful ones.

In commenting on Tekes application and selection procedures, respondents emphasised a small number of points. First, in some cases Tekes processes are perceived to be too rigid and bureaucratic in relation to the fast evolving operational environment of companies. As such there were a number of calls for Tekes to speed-up its decision-making process. It was noted in a few comments that there have been marked delays in funding decisions during the last year or so. Many customers would also like to see simplified and streamlined (or less bureaucratic) procedures and reporting requirements and a greater degree of ‘customer orientation’ in communications and interaction. This finding from the survey was confirmed during the interviews.

Finally, several respondents criticised the role of consultants in the project planning and monitoring stages. It is felt by some that Tekes is becoming increasingly dependent on consultants that may add some value but only to a rather limited extent. Some customers felt that Tekes own staff could usefully occupy some of the roles and perform some of the functions increasingly assigned to consultants.
3.7.1 Feedback on applications

Customers were asked about the extent to which Tekes has met their expectations in relation to feedback on their applications, both successful and unsuccessful. The results are presented in Figure 17 and reveal that customers provided relatively low ratings for the clarity and accuracy of Tekes feedback on unsuccessful applications. While the majority of customers had their expectations met (33%) or surpassed (27%), a relatively high proportion (40%) stated that Tekes had failed to meet their expectations in this regard. Ratings for advice on improvements to successful applications were much more positive – just over half of the customers (51%) stated that Tekes had exceeded their expectations, although a quarter (26%) indicated that Tekes could and should have done better on this measure.

Unsuccessful applicants (non-customers) provided significantly more negative ratings than customers in relation to the feedback they received on their applications. This is perhaps not a surprise given that the feedback accompanies a decision not to support the project. However, only 28% of unsuccessful applicants had their expectations met with regard to the clarity and accuracy of feedback on their unsuccessful proposals, less than half of the proportion of existing customers who were satisfied in this regard.

In terms of qualitative feedback, the main point raised here was that Tekes should strive to provide more and better feedback to applicants who did not obtain support.

3.7.2 Tekes support during project implementation

Customers were asked to indicate whether and to what extent Tekes has met their expectations in terms of providing useful support during project implementation. The results are represented in Figure 18 and reveal a strongly positive set of feedback responses; with over 80% of customers indicating that their expectations had been met or surpassed in relation to each aspect of Tekes support during project
implementation. The most strongly positive ratings were obtained in relation to the timeliness of Tekes issuing of payments but the results also indicate that in most cases Tekes is viewed as performing well in terms of the advice and support it provides through the different stages of the project and is widely seen as flexible in responding to unforeseen issues or problems.

**Figure 18. Extent to which Tekes meets customer expectations – support during projects (n=918-927)**

The feedback here was largely positive but a number of comments were received in relation to the quality of Tekes support during and subsequent to project implementation. The main points were as follows:

- There is a need for more flexibility, for instance in relation to changes to the content of funded projects.
- The scheduling of payments (after the reporting) is difficult, especially for start-ups and small companies and can cause them temporary liquidity problems.
- A more proactive approach and frequent contact with companies is seen as desirable, both during the projects but also when there are no on-going Tekes funded projects. Company visits could be undertaken to find out company plans, to advise on these and to identify areas where support can be provided both by Tekes and by other agencies.
- Improved follow-up of completed projects is desirable in order to find out and support continued development of promising ideas with business potential. It may also be useful if the impacts of the funded projects could be followed more closely afterwards (e.g. 2–3 years after the completion of a project). This should facilitate not only an improved understanding of impacts but would also allow Tekes to improve its own learning and competencies, particularly in relation to the appraisal and selection of projects most likely to lead to growth/success.
3.8 Customer feedback on advice received from Tekes

Tekes customers were asked to indicate whether Tekes provides useful feedback on their business ideas and innovation strategies and the results are represented in Figure 19. The results show that only around a third of Tekes customers feel that they really have received useful advice from Tekes in relation to their business ideas and innovation strategies, suggesting that this is not one of Tekes main services or one of its main strengths. Unsuccessful applicants assigned even less positive ratings and were significantly less likely to agree that Tekes has provided useful advice.

![Figure 19. Tekes customer views on advice received from Tekes (n=788-810)](chart)

3.9 Overall ratings for quality of Tekes processes and personnel

Customers were asked to provide overall ratings regarding the extent to which Tekes meets their expectations in terms of the overall quality of (i) its procedures and processes and (ii) its personnel. The results are shown in Figure 20 and appear to confirm at a general level the more detailed perspectives provided above, namely that:

- Tekes meets or exceeds the vast majority of its customers’ expectations with regard to the overall quality of its processes and procedures, with customers’ expectations being surpassed in just over half (52%) of cases and met in 30% of cases. This compares to 18% of cases where Tekes has failed to meet customers’ expectations.
- Tekes performs even better in terms of meeting customer expectations in relation to the quality of its personnel. Here Tekes exceeds its customers’ expectations in almost two-thirds (62%) of cases and meets them in a further 24% of cases. This compares to 14% of cases where customers’ expectations have not been met.
Unsuccessful applicants (non-customers) provided significantly lower ratings than successful applicants (customers) on both of these general aspects.

This is also in line with Tekes own customer satisfaction survey. In 2011, Tekes customers gave the quality of the services an average of 3.8 and those which received the funding gave it a 4.1 on a scale of 1-5 where 3 corresponds to expected quality.

The qualitative comments provided by respondents to the surveys indicate that Tekes personnel have a crucial role in managing the interaction between the funding agency and its customers and that this interaction ‘shapes’ to a large extent each individual customer’s perception of Tekes. The expertise of Tekes staff is a source of mixed opinions. On the one hand there is some criticism concerning the competence, attitude and lack of business experience among the staff (or the ability to assess scientific quality because of too few PhD graduates at Tekes), while on the other hand many respondents comment very positively about the expertise and customer orientation of Tekes personnel. The highly differing views here reflect, at least partly, the composition of survey respondents – those that have been unsuccessful in obtaining funding support from Tekes seem to be rather critical and those that have been more successful have a much more positive perspective.

Some commentators also suggested the role of the assigned Tekes contact person at the application phase can be a crucial factor in whether the application is successful. In several cases respondents stated that success or failure can have as much to do with the contact person assigned as it does with the ‘objective’ quality of the project proposal. Applicants seem to judge the competence of the Tekes contact person largely based on their ability or willingness to provide the correct (i.e. a favourable) funding decision, with those that say ‘yes’ being judged to be competent to render that decision and those who say ‘no’ being considered incompetent.
3.10 Summing up

Reflecting on the results presented in this section, Tekes performs well overall with regard to the quality of its processes and personnel and is in general terms a very well regarded agency. The areas where ratings are lowest and where improvements are called for relate mainly to the following aspects:

- The effectiveness of its signposting to other agencies in the event that the support requested by customers is not available directly from Tekes
- The level of administrative burden in its application processes
- The clarity and accuracy of its feedback on unsuccessful applications
- The timeliness (i.e. speed) of its appraisal and selection processes
- The connection of their advice to the business practice of their customers

While these are the aspects that are most likely to fail to meet customers’ expectations, it is important to note that even here most customers’ expectations have been met or exceeded. It may therefore simply be a case of Tekes improving the consistency of its actions in these areas, in order to ensure that all customers receive the high quality of service that most customers already attest to.
4 Tekes effectiveness: results and impacts

Our approach in this study involves largely relying on existing evidence about Tekes overall impacts. There is a considerable body of evidence that shows Tekes funding has significant and positive effects at the level of the individual company. There is less but positive, evidence that shows that there are important spillovers from Tekes funding from beneficiaries to the wider society. The existing body of evaluation, however, takes little account of long-term or systemic effects. To that extent, it is likely to understate the importance of Tekes funding in national technological and economic development.

4.1 Do Tekes-style interventions have impacts in theory?

Innovation in general involves the entrepreneur in investing in a ‘new combination of factors of production’ to generate a product or process that offers an advantage in the market. If customers find the innovation (or the results of the innovation, such as lower prices) attractive, it confers an advantage on the entrepreneur, who can for a period earn ‘super-normal profits’. After a while, imitators erode the competitive advantage and the rate of profit declines. The decision to innovate is based on the entrepreneur’s judgement about risk: How likely is s/he to get back more in profits than the cost of the investment? The economic relationship between innovation and growth is pretty solidly established, for example in the economic production function and productivity literature, so the state has a strong interest in promoting innovation by sharing technological risks with individual entrepreneurs and by offering them support that will help them make better judgements about risk. The opportunities to intervene in this way are especially large in technological innovation – both because this is an area where risks genuinely can be reduced and because of the peculiar nature of knowledge, which can be produced much as other goods can but has rather different properties. These, together with the nature of knowledge producing and using institutions, give rise to market and systems failures that limit economic performance and growth. Addressing these can produce large societal returns to state intervention. The effects of intervention are not only short term but – over a longer period – can be very substantial.
The standard economic argument for the state to pay for research is that the special nature of research makes it an unattractive investment for the private sector. In economic terms, knowledge is a ‘non-rival’ good – meaning that many people can consume it at the same time. (Most goods, for example cake, are ‘rival’. If I eat the cake, then you cannot. Knowledge is one of the special cases where you can have your cake and eat it.) Knowledge is also ‘non-excludable’ – it is hard to stop people getting access to it. Non-excludable, non-rival goods are ‘public goods’. In theory the market cannot produce these, so since we need them the state must pay.

The idea of ‘market failure’ leading to under-investment in research has been the principal rationale for state funding of R&D in the post-War period\(^\text{15}\). The inappropriability or non-excludability of research results mean that they tend to ‘spill over’ from one economic actor to others. For the individual capitalist, spillovers are economic losses that make investment unattractive – they encourage imitation, for example. From the perspective of society, these spillovers make knowledge a good investment – they provide the societal returns to the state’s investment because many different parts of society can use the knowledge.

In practice, real companies (and other producing organisations in the economy such as parts of the public service) vary in their ability to make use of external knowledge. Wesley Cohen and Daniel Levinthal introduced the idea of varying ability to use external knowledge or ‘absorptive capacity’ to the R&D and innovation literature\(^\text{16}\). They define absorptive capacity as “the ability of a firm to recognise the value of new, external information, assimilate it and apply it to commercial ends” and say that absorptive capacity is closely linked to companies’ ability to do internal R&D. Michel Callon\(^\text{17}\) has pointed out that not only technology but also science is in fact very costly for the individual company to exploit. It requires still greater absorptive capacity, not only in terms of people and their abilities but also other resources such as equipment and facilities. Thus, while scientific knowledge is in principle a ‘public good’, it is not always publicly accessible because users typically have to invest a lot of resources in order to use it. Companies need to learn to value and to use external knowledge.

These difficulties in using as well as producing knowledge help explain the importance of knowledge in competition. They also underline the importance of people – many of those who ‘use’ knowledge in companies come from and have tight network links with those in ‘knowledge producing’ organisations such as research institutes and universities. If we look at the production and the use of knowledge, it turns out that both are highly networked activities. Derek de Solla Price\(^\text{18}\) pointed out a long time ago that leading scientists tend to work in ‘invisible colleges’, which


\(^{18}\) Derek de Solla Price, Little Science, Big Science, New York: Columbia UP, 1963
do not respect national borders. Technology networks have similar dynamics. Often they focus on supply chains but like scientific networks they depend on trust and they provide access to competitively important information that is not available to outsiders. This is not the only reason why “innovators do not innovate alone”\(^\text{19}\) – for example, clustering creates markets for labour with scarce skills and builds the scale that enables others to offer specialised producer services that bring rivals to live side by side in “industrial districts”\(^\text{20}\). But the networked nature of technology is itself a strong reason for clustering.

In addition to market failure, therefore, there is a range of ‘systems failures’ that prevent the optimal use of knowledge. These include ‘capabilities failures’ (where producers lack the ability to access knowledge or take fully rational decisions), ‘network failures’ where networking either works badly and knowledge fails to spill over or works so well that organisations get ‘locked in’ to technologies, knowledge and beliefs that are of declining relevance.

Tekes traditional instruments address these failures. They tackle market failure by providing financial and other incentives that reduce the economic risks of innovation activities and increase companies’ abilities to assess those risks, especially for smaller and younger firms that cannot afford much risk. More risk-taking means more attempts to innovate, some of which are successful and lead to increased competitiveness and economic growth. The same incentives can lead to ‘behavioural additionality’ or learning, especially through acquiring increased absorptive capacity for technological and scientific knowledge. This capacity increases the firm’s ability to evaluate and take risks on its own account. As it learns, it may continue to have a relationship with Tekes but its needs for, and use of, Tekes instruments will change – primarily towards using Tekes as a way to combat market failure because that is a permanent feature of markets.

Thus, the very large firms that are major ‘beneficiaries’ of Tekes funding are well beyond the stage of needing external funding to teach them the value of internal R&D capacity. They do not spend the Tekes money internally. Tekes provided €58m in grants to firms with more than 500 employees in the period 2008-10. Of this money, €28m were passed on as research contracts to universities and research institutes; €10m were used by the companies to co-finance projects in the universities and institutes and a further €19m went to SMEs, acting as R&D sub-contractors for the large firms. The large firms themselves retained €1m of the €58m they received in grants\(^\text{21}\). Here, the Tekes grants directly address the market failure, with almost all the money being spent in public research institutions where it will generate spillovers in addition to providing knowledge of importance to the ‘beneficiaries’ of the grants. These spillovers take the form of knowledge and human capital: business


opportunities; people trained (typically as PhDs or post-docs) during the course of the projects, who can subsequently be employed in the research institutions, the companies or elsewhere in the relevant sector and who carry with them technological knowledge and experience from the projects funded. The use of such knowledge and human resources in turn leads to other spillovers such as ‘producer surplus’ among other companies and ‘consumer surplus’ in the case of consumers who benefit from improved products and processes or lower prices as an ultimate result of the work.

The SHOKs are an extension to Tekes technology programmes that share characteristics with ‘competence centres’ in other countries. Their main purpose is to cluster research and industrial R&D activities around themes of industrial and societal importance, strengthening and extending research and technology networks, creating long-term sustainable relations between the research and producing sectors, using the producers’ understanding of production and markets as a basis for signalling research needs and the researchers’ interest in fundamental research to inject more a fundamental understanding into company R&D. Both here – and in the case of Tekes technology programmes, which typically target clusters or supply chains where project spillovers tend to accrue rather directly to stakeholders in the programme – Tekes instruments have been shaped towards using networks both as ways to signal the importance of individual research and innovation problems and as ways to capture spillovers. This has the additional advantage of minimising the extent to which the state ‘picks winners’ at the level of individual companies. Rather, the state shares risk with and generates spillovers for, a network of companies and people – increasing the likelihood that there will be a return on its investment.

4.2 Tekes impact framework and evidence about impacts

Tekes has commissioned large numbers of evaluations, primarily at the programme level, in the period going back to 1990 and before. Here we review relevant literature produced during the last decade. There are four kinds of studies relevant to this question:

- Econometric and statistical studies of the effects of subsidies in Finland
- More qualitative, survey- and mixed-methods studies of Tekes programmes and projects
- Studies based on the Sfinno database of Finnish innovations
- Studies based on Tekes own project assessment and monitoring system

Broadly, econometric and related statistical studies take R&D funding of companies as an independent variable and try to explore its relationship to dependent variables at the company level, such as R&D investment, turnover, employment and so forth. A frequent objection to this approach is that demonstrating a statistical relationship...
between variables is not the same as showing causality\textsuperscript{23}. In developed countries, especially, it is also very hard to find robust counterfactuals or control groups. However, the evidence from Finnish studies is consistent both with the broad findings of the ‘classic’ US work in the field such as that of Mansfield and Griliches\textsuperscript{24} as well as studies in small countries such as Austria.

A lot of attention is given to the questions of ‘input additionality’: does R&D subsidy lead companies not only to use the subsidy on R&D but in addition put in extra amounts of their own money, compared with what they would otherwise have spent? Economists are interested in this question because the naïve economic model of the firm as a short-term profit maximiser implies that a company receiving a grant would simply free-ride, using the external funding as a substitute for the money it would in any case have spent on R&D. Neither the Finnish work nor that done abroad supports this ‘crowding out’ hypothesis. Rather, it suggests that R&D funding ‘crowds in’ additional R&D investment by the beneficiaries\textsuperscript{25} so that in one study the companies added €1.02 of R&D investment to each euro of R&D grant they obtained\textsuperscript{26}. Another study by the same author found that €1 of R&D grant crowded in something between €0.62 and €0.86 in additional investment by the beneficiaries\textsuperscript{27}. Thus, companies doing Tekes-funded R&D invest more of their own money in R&D than those without Tekes funding\textsuperscript{28}. A range of studies then finds this increased R&D spending to be associated with increased employment\textsuperscript{29}, patenting\textsuperscript{30}, innovations\textsuperscript{31} and productivity\textsuperscript{32}.

Survey-based approaches tend to show that beneficiaries believe the R&D subsidy improves their performance along a number of dimensions. Programme evaluations consistently find that surveys of project managers indicate that participation increases competitiveness and economic performance – though normally the respondents are unable to quantify these effects and the surveys tend to be conducted during the life of the programme concerned, so that the overall benefits have in many cases still to be obtained. Tekes projects increase companies’ interest in doing R&D in general, including within the EU Framework Programme\textsuperscript{33}. It increases the risk level and productivity of R&D projects, increases networking, increases human capital and

\textsuperscript{23} It may, however, be worth reminding ourselves that we regularly entrust our lives to the medical profession, for whose practice the evidence base tends to have exactly this character


\textsuperscript{25} Jyrki Ali-Yrkkö, Impact of R&D Financing on Employment, ETLA Discussion Paper, 980, 2005


\textsuperscript{28} Jyrki Ali-Yrkkö and Mika Pajariainen, Julkinen t&k&i-rahoitus ja sen vaikutus yrityksiin – analyysi metalli- ja elektroniikkateollisuudesta, ETLA Keskusteluauheita 846, 2003

\textsuperscript{29} Bernd Ebersberger, Labour Demand Effect of Public R&D Funding, VTT Working Papers 9, 2004

\textsuperscript{30} Bernd Ebersberger, The Impact of Public R&D Funding, VTT Publications, 2005

\textsuperscript{31} Bernd Ebersberger, Pattern of Innovative Activities among Finnish Firms, VTT Publications, 2005; Kajia Hovi, Olavi Lehtoranta, bernd Ebersberger and Jukka Hyvönen, Suomalaisen yritysen innovaatiotoiminnan muuttuvat muodot, teoksessa Pekka Pesonen (toim.), Uutta tietoa ja osaamista innovaatiopolitiikan käyttöö, ProACT-tutkimusohjelma 2001-5, loppuraportti, Tokes 2006; Tempo Economics Oy, Katsaus Tekesin toiminnan vaikutuksista tuottavuuteen ja eikeneppelämän uusiutumiseen, julkaisematon selvitysraportti, 2010

\textsuperscript{32} Hannu Piekkola, Osaamispääoma ja innovaatioihin tukenimen kavun lähteinä – Seutukuntien kilpailukyky, ETLA B-216, 2006

\textsuperscript{33} Gaia Consulting, Tekesin julkisen tutkimuksen vaikutuksen arviointi, Tekesin ohjelmaraportti 7/2008, 2008
impacts longer-term business strategies of companies. Two-thirds of companies believe Tekes funding leads to increased net sales\textsuperscript{34}.

The Sfinno database enables exploration of longitudinal data about significant Finnish innovations over a long period. Its scope has been increased to include service innovations in recent years. Its relationship with the universe of Finnish innovations is not completely clear, since it relies on observing innovations through secondary sources. Nonetheless, it contains 4900 observations for the period 1945–2009. Survey data suggests that 51\% of innovations recorded in the period 1985–2007 were significantly aided by Tekes funding; another 11\% were also Tekes funded but the funding was not seen by the innovator as being especially significant. Tekes money was most important in relation to innovations with medium and high complexity\textsuperscript{35}.

Tekes own impact framework is shown in Figure 21. It is intended to provide a framework for meta-analysis of individual studies, showing how their conclusions fit together to demonstrate an overall logic. Hyvärinen has reviewed about one hundred studies using this framework and shown that they are collectively consistent with that framework. His main conclusions are as follows.

- Tekes funding has direct and positive impacts upon innovation activities
  - It has activated firms to increase R&D and to take larger risks by sharing these with the state
  - It has enabled the creation and use of new knowledge and technologies
  - It has increased challenges, quality and cooperation in R&D
  - It has been successful in sharing technological, business and financial risks of R&D projects
  - It has extended the size, scope and duration of projects

- Tekes funding has increased the quality and quantity of innovation activities, increasing firms’ knowledge capital as well as the extent of spillovers. These affect, among other variables, productivity, renewal of innovation activities and networking.

- Tekes funding has triggered innovations that increase the rate of growth, support globalisation of Finnish industry, commercialise products, services and new business processes. It contributes to building networks, cooperations, new research areas and knowledge bases.

- There is evidence that Tekes funding helps increase firm-level productivity and business renewal. Here, however, more study is needed to increase the amount of evidence.

\textsuperscript{34} Pekkanen, Innovaatio investointina - Osa 2, Tekesin rahoituksen vaikutukset t&k-toimintaan – Kyselytutkimuksen tulokset, Tekes, Teknologiakatsaus 161, 2004

\textsuperscript{35} Hyytinen et al, 2012
4.3 Long-term and systemic impacts

It is reasonable to expect rather direct results where Tekes funds a single firm to do intra-mural activities. But a lot of Tekes funding is also for cooperative and extra-mural activities. We know from three decades of evaluating various kinds of collaborative research that a lot of the knowledge produced in these does not find its way directly into innovations over the short term. They tend to produce ‘intermediate knowledge products’ that may subsequently be picked up and used in later innovations, which provide guidance about good or bad research avenues, help set common agendas or act as precursors to norms and standards\(^{36}\). It is also clear from previous evaluations of Tekes work that these projects also develop capabilities in the research infrastructure and supply chains. It follows that we must not just take a short-term approach to the societal benefits of Tekes funding.

The time constants linking research and innovation funding to societal and economic effects can be very long. This was shown in two early landmark studies of the long-term effects of R&D – Hindsight and TRACES, both conducted during the

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1960s. DoD’s Project Hindsight\textsuperscript{37} looked at twenty weapons systems and identified ‘RXD (research or exploratory development) events’ that had fed into them. Two-thirds of the events occurred long before the system was in development. The median time between an R&D event and its use in development was nine years. The research with the greatest impact tended to be applied but generic, i.e. not directly connected to a single weapons system but applicable across multiple systems. Results from undirected basic research typically took about 20 years to implementation while those from directed basic research took about half as long. NSF’s TRACES project\textsuperscript{38} studied ‘critical events’ leading to five innovations: magnetic ferrites; the videotape recorder; oral contraceptives; the electron microscope and matrix isolation\textsuperscript{39}. Crucially, the TRACES team looked further back in time than the 20-year horizon used by Hindsight. It found that applied research events are important in the twenty or so years prior to innovation while basic research events stretch up to 50 years back, with a peak in the interval 20-30 years before innovation.

In addition to the obvious lesson that what you see depends upon where you look, these studies underline the long periods involved in using research results in innovation, the interdependence of applied and basic research and the importance of being able to bring together pieces of knowledge from disparate sources. The innovator has to assemble a lot of components from the stock of knowledge, mixing more generic basic and applied research results with more innovation-specific applied research, development and application results in order to innovate. The innovation process is non-linear. Often ideas are unused until complementary pieces of knowledge are put in place – and this may involve basic as well as applied research.

Interest in long-term R&D funding impact studies has reappeared in Sweden during the last decade, where VINNOVA (the Swedish innovation agency) has funded a series of long-term studies of the effects of use-driven R&D funding programmes by itself and its predecessor agencies (NUTEK and STU, whose design and programming practice heavily influenced that of Tekes). These show strong and positive impacts on industry and the research system more broadly.

A recent meta-analysis\textsuperscript{40} of the fourteen studies undertaken so far found that:

- VINNOVA and its predecessors have played important roles in identifying, defining and growing new areas of needs-driven R&D in a process of dialogue with the research and industrial communities. This would not have been achieved had the funding been under the unique control of either the research or the industrial community.


\textsuperscript{38} H Loellbach, Technology in retrospect and critical events in sciences (TRACES). Vol. 1. Chicago: Illinois Institute of Technology Research Institute, Contract NSF-CS35 with the National Science Foundation, December 1968; and Vol. 2. Chicago: Illinois Institute of Technology Research Institute, Contract NSF-CS35 with the National Science Foundation, January 1969

\textsuperscript{39} A technique for trapping small amounts of a chemical within an unreactive matrix, easing analysis, for example using spectroscopy

\textsuperscript{40} Lennart Elg and Staffan Håkansson, När Staten Spelat Roll: Lärdomar av VINNOVAs Effekstudier, VINNOVA Analysy VA 2011:10, Stockholm: VINNOVA, 2011
This has been achieved through a combination of ‘bottom-up’, responsive mode funding and programming that permits promising areas to be scaled up.

Programmes need both to be flexible – reflecting the uniqueness and adapting to the evolution of each field – and ‘patient’: long programmes have greater effects on beneficiaries’ strategies and learning than short ones.

Time constants are constantly underestimated in R&D funding. It is not uncommon for 10-20 years to elapse before socio-economic effects of any size are visible.

Hence, it is important to avoid the ‘project fallacy’ (i.e. the idea that the contractually-defined project is necessarily a meaningful entity to the beneficiaries). Rather, longer-term interactions allow beneficiaries to pursue their ‘real projects’ and strategies.

Key effects of funding have been the development of new clusters of human capital and organisational learning so as to develop the capacity and capabilities of the innovation system, not just to underpin individual innovations.

While in many cases major economic effects have been obtained in large, existing companies, the creation of new firms is necessary in order to create a varied selection environment with many opportunities for experimentation and learning.

Since about 1990 (when many of the Swedish multinationals began to merge with foreign companies), globalisation has meant that a key aim of R&D funding is not to ‘support’ wholly-Swedish companies but to make the Swedish innovation system attractive to companies irrespective of their ‘nationality or trans-nationality’.

Where R&D programmes address societal needs, they have to connect with effective demand (i.e. users willing and able to pay).

There appear to be no equivalent studies of the long-term effects of Tekes activities, though the historical dimension of the series of case studies in the recent exploration of Tekes roles in the innovation system strongly suggests that Tekes has had a similar influence. In this connection, the example of Nokia shows how Tekes relationship with the innovation system has been developmental, changing over time.

The amount of financing granted to Nokia by Tekes increased in nominal terms until in the 1990s. In the 2000s the nominal figures for Tekes funding stayed at the same level as in the 1990s but the share of Nokia’s total R&D expenditure (as financed by Tekes) drastically decreased from more than 25% in 1980 to 0.16% in 2009. Overall the participation of Nokia as a leading firm in the ICT industry has been a significant driver in Tekes technology programmes in particular and the Finnish innovation environment in general. Many Finnish SMEs have been able to exploit Nokia’s global networks and cooperation between firms in the ICT-sector has intensified, not only between Nokia and SMEs but among other companies and academia as well.
Some of the descriptions of interventions over time offered in this study suggest there have been areas of substantial impact over the long term – but these need considerably more detailed exploration in order to provide more solid evidence. In a number of cases (e.g. electronics, construction and real estate), Tekes has operated a series of programmes, with a slowly changing character as industrial capabilities have grown. It is likely that Tekes plays a role in the longer-term development of such fields that is not captured in short term evaluations. It is easier to see examples (like biomaterials) where Tekes has been instrumental in establishing a field in Finland.

The example of public funding for Finnish mobile telephony suggests that very occasionally the impacts of such intervention can be spectacular. Sadly, the impacts of intervention rarely turn out to be quite so positive. But the Tekes evaluation record still leaves room for a lot of exploration that would enrich our understanding both of impacts and how to obtain them over the longer term.

4.4 Overall effectiveness

Overall, Tekes impacts on economic development show that the organisation has made and continues to make a substantial and positive difference, driving up the rate of innovation and growth. The tendency to look for project-by-project impacts probably conceals Tekes role in coordinating technological development and building strong networks in Finnish industrial clusters. That is a subject on which further study is needed. But on the evidence available, Tekes richly deserves its international reputation as a leading technology and innovation agency. While the increased focus on start-ups and small-scale entrepreneurship is a useful complement to Tekes traditional role, it would be a mistake to abandon Tekes core function in technology, where it addresses with effectiveness a permanent set of needs.
5 Effectiveness of Tekes interventions

5.1 Start-up support and growth companies

In line with the Tekes strategy, the share of total Tekes funding that was allocated to SMEs and young innovative companies has increased since 1994. The Tekes customer base is to a large extent composed of young firms: 35% of Tekes customers are less than 5 years old (Figure 22).

Figure 22. Distribution of Tekes customers by age

Tekes sees a clear role for itself in supporting young innovative companies, because there is a market failure (information asymmetry) that causes private investors to be reluctant to invest in early stage companies. The Finnish economy does not have enough export-capable medium-sized companies. The ability to generate or attract skilled entrepreneurs with international networks and experience needs to be improved. At the same time, values and attitude towards entrepreneurship are slowly changing in Finland. Students, for instance, are generally more enthusiastic about entrepreneurship. In the past, people in Finland have been regarded as very risk-averse and getting rich quickly or being the owner of a successful business has been suspicious. Government has also traditionally had a much bigger role in Finland than in comparable countries.

During the last years, Tekes has attempted to breed new growth companies, new emerging companies and young innovative companies. Its funding to companies less
than six years of age has doubled in the last ten years and was in 2010 over €100 million (around 27% of the total R&D funding of Tekes). The support from Tekes to growth companies is based on three different objectives:

- Firstly, Tekes seeks to generate new, emerging companies by supporting the commercialisation of research results, by examining patent portfolios of large companies and by making funding decisions to refine high-risk business ideas.
- Secondly, Tekes is funding fast growing companies and has launched a specific funding instrument to fund Young Innovative Companies. Since its start in 2008 and up until the end of 2010, more than 80 young innovative companies have had positive funding decisions. A majority of funded companies operate in the ICT sector but also some companies in the energy, environment and biomedicine sectors were funded.
- Finally, Tekes is also funding R&D and innovation efforts in moderately growing companies.

Among the high-growth (HG) companies in Finland there are many that received support from Tekes.\(^4\) In manufacturing, one-third of these HG companies have been funded by Tekes. The total share of HG companies that has received public aid is 76%. In knowledge intensive services\(^4\) 65% of the companies have received public funding and Tekes has supported 25% of them. Also, when using other methods to single out HG companies, the share of Tekes funding to this type of companies is about the same.\(^4\)

Tekes is actively involved in companies with new-to-market (or radical) innovations. While the number of small (10-15 employees) companies with new or radical innovations decreased by 28% (from 1339 to 969) in the period 2006-2008 – probably due to the financial and economic crisis – the share of these companies that received funding from Tekes rose from one-quarter to one-third.\(^4\) It should be noted that the share of Tekes involvement in large companies with radical innovations is even bigger and it has increased between 2006 and 2008, from 63% to 71%. While this does not seem to be in line with the new strategy, it is, however, following on from the total number of large companies with radical innovations being very small. Among all the companies with radical innovations, Tekes involvement is at about the same level regardless of sector, i.e. in manufacturing, in the ICT sector as well as in other knowledge-intensive services sectors.\(^4\)

According to the periodical Wired, ten Finnish companies qualified as being among the hottest start-ups in Europe.\(^4\) All of them were funded by Tekes, including Rovio (Angry birds). On the Deloitte Technology Fast 50 Finland list, at least 45 of the 50 listed companies had received Tekes funding. The ten fastest growing technology

\(^4\) By definition, this means that the companies have an average employment growth that exceeds 20% over a three-year period and that they have more than five employees. In Finland there are 1,902 HG companies over the period 2006-2009. (Source: Statistics Finland, the Business Register and Business Aid Database).
\(^4\) Including legal and accounting activities, scientific R&D and architectural and engineering activities.
\(^4\) Source: Statistics Finland, the Business Register and Business Aid Database.
\(^4\) Ibid.
\(^4\) Wired, autumn 2011.
companies were all Tekes customers. There is also an annual nomination by Red Herring of the most innovative technology companies. In a list of 300 companies, there were eight Finnish companies, all of which have been funded by Tekes. Three of the Finnish companies were listed among the best 100.

After funding in the early 2000s, Tekes customers’ productivity growth has been higher than for all other companies. At the time of the funding, productivity growth was lower than for all other companies but after five years it was significantly higher.47

From the Tekes monitoring of young innovative growth companies, a number of conclusions are drawn.48 First, the growth in these companies is clearly faster than in others and public funding is described as not displacing private funding. These companies are networking and network leaders; it is concluded that growth orientation and networking work well together. Young growth companies also force businesses to focus, to take less reckless risks, towards decentralisation and more forethought. Companies also become, however, more aware of the limits of their abilities. Early internationalisation spurs the ability to grow.

In our interviews and focus group discussions with representatives of different stakeholders, a mixed picture has emerged regarding Tekes new strategy towards SMEs and young innovative companies.

Most interviewees regard R&D funding as Tekes main achievement over the last 5-10 years. They are definitely seen as having made companies focus and invest in R&D and they have successfully facilitated collaboration between universities, companies (also SMEs) and institutes in that area. Their programmes are judged as having been seminal in putting the light on important areas like mobile communication, nanotechnology and so on. Tekes has thus had a lot of influence on renewal of R&D and has been able to change and develop in response to development as a whole. They started with technology R&D funding, which is where the home turf still is and where they seem comfortable.

However, there has been a shift in perspective – Tekes has made it possible to support public-private partnerships and small organisations by changing their rules and terms. Some respondents appreciate Tekes new efforts towards new and innovative companies and towards stimulating commercialisation of research results; others however regard Tekes as rather bureaucratic and ineffective. There are concerns that Tekes is lacking the skills to fully understand how to start, run and manage a business enterprise. Evaluating entrepreneurs and teams, investment and so on requires a different approach and skill set compared to the evaluation of R&D projects. Many respondents feel Tekes has a long way to go and many things to learn. The tailoring of evaluation and monitoring processes towards business projects is seen as an area of improvement for Tekes. (E.g. by having lighter evaluation processes, more emphasis put on auditing and having stricter controls and sanctions when

48 Tekes Monitoring Growth Companies (Autio et al, 2010).
rules are broken). The culture and staff of Tekes are still regarded as technology-orientated, rather than business-orientated. Some suggest that Tekes should go very carefully through its recruiting policy and criteria.

In a broader sense, the Finnish system as a whole is seen as not producing enough breakthrough innovations and commercial results. Traditional R&D grants are insufficient to make commercial success. By starting to give loans, Tekes is perceived as offering some of the right incentives to stimulate commercial success. It is suggested that Tekes could strengthen its linkages with VC, while not taking a VC role.

To be able to do more for growth companies, Tekes might need to expand their definition of R&D and/or innovation. They should also do their best to facilitate the best talent and not use soft money (grants) to hurt hard money (VC) processes. Better targets for companies, leading to stronger selection, should also be introduced, combined with less guidance on how money should be used, since the surrounding world is changing very fast.

Tekes should not be put in the position of ‘picking winners’ in a quasi venture capital role. It does not have the right skills to do so and it does not have the VC-style economics that would enable it to take business risks. Its role is to sustain the technological basis to allow technology-based winners to develop.

5.2 Tekes programmes and SHOKs

The Tekes programmes, of which 25 new ones have started since 2006, differ from each other not only in focus but also the extent/volume and length of the programmes. The programmes reflect the times of their preparation and their focuses have changed over time. During the review period, the programme size measured by volume in Euros and length measured in years have increased markedly. A programme often belongs to a chain of programmes succeeding each other chronologically and builds on the results and networks created in preceding programmes. For instance, in the field of construction and real estate, a series of five programmes were implemented between 1997-2007, aiming to bring about a gradual clustering of the distinct fields of construction and real estate industries.

Within the chains of programmes, the more recent programmes have typically more explicit focus on business impacts (e.g. business models) and institutional change (e.g. industry practices, platforms), whereas earlier programmes were more clearly technology focused. This represents a learning process based on feedback and evaluations, shifting innovation policy goals and the evolving role of Tekes.

Programmes are the Tekes instrument for more basic research and networking. According to the programme evaluations that have been carried out, most of the evaluated technology programmes have had catalytic effects which have:

- Promoted networking between companies and R&D organisations in the targeted fields and clusters and brought together researchers and industry professionals from many backgrounds
• Strengthened R&D and increased research collaboration between researchers within a field and across discipline borders
• Increased research collaboration within industries
• Contributed to building capabilities and developing competencies in companies which have had positive impacts on competitiveness
• Supported awareness raising, clustering and emergence of communities of practise among actors in a field or cluster

Programmes seem to have impacts on the participating companies for instance in the form of strengthened capabilities, increased awareness of technologies, models etc. to increase their competitiveness. Also networking gains are identified among participating firms. Direct impacts to new products and commercialisation are less unevenly distributed impacts in programmes. Some evaluations conclude a significant number of innovation outcomes while others have largely failed to contribute to the development of new products. Impacts on industry restructuring have been dependent on the industry maturity and lifecycle. In nascent domains (e.g. biomaterials; see COMBIO evaluation), the contribution of Tekes is rather clear, as it can influence the direction of research and innovation efforts through its funding in a new emerging field. In mature industries (e.g. manufacturing; see Masina evaluation) the contribution to a structural change has been more challenging due to the rigidities in the industrial structure.

In introducing the SHOKs, Tekes has innovated a Finnish variant of the move towards ‘competence centres’ in other countries by setting up long-term R&D-based relationships among clusters of firms and relevant universities and institutes. (All three comparative countries have competence centre programmes: VINN Excellence in Sweden; COMET in Austria and the CSETs in Ireland.) This addresses a need to signal about and build critical R&D mass in, a limited number of thematic areas that matter to Finnish industry and society. A first evaluation of the company perspective on SHOKs by the Finnish Federation of industries in 2011 has some mixed messages. Although quality research is supported (better top research, for use by Finnish companies, than ever before) and genuine collaboration occurs, there is a mixed feeling about the business value of SHOK research and the accessibility for SMEs.

The findings of this evaluation confirm practical problems with the SHOK implementation: dangers of a lack of joined vision (because of too little trust among parties involved), too short a time horizon and crowding out new challengers in the sector, appear large. Furthermore the IPR regulations may be too open for companies to bring in their really good ideas. Steering possibilities for Tekes are limited. The experience seems mixed, depending on the SHOK and the position of the observer; SHOKs are still very young and hardly anybody thinks that SHOKs are the wrong direction in which to go. Such centres can only operate with clusters that have reached a certain level of self-awareness and maturity and where firms are technologically capable. The SHOKs ought to induce some behavioural addi-
and encouraging them to create and deepen such relationships. They complement but do not displace Tekes technology programme activities and its bottom-up project-by-project funding, where Tekes acts on the one hand as a change agent supporting industrial strengthening and renewal and on the other as an antidote to technology-related market failures.

The separate SHOK evaluation that has been assigned this spring should go into this in more detail. The budget for SHOKs however is so big that Tekes/Finland can't afford to let the SHOKs go on in a suboptimal way for too long.

The Tekes programme approach that was developed recently in addition to the SHOKs, with two different types of programmes: research-orientated programmes for the strategic renewal of the Finnish knowledge base and need-driven programmes meeting the strategic development needs of SMEs seem suitable to pick up and organise real new developments and cater for the needs of innovative SMEs. This approach (especially the focus on SMEs) must however still prove itself as must the interaction with the SHOKs. The balance between SHOK funding and Tekes programme funding must also be constantly monitored and set out against the need for renewal in existing sectors (SHOKs) and renewal of sectors (Tekes programmes), taking into account results that are achieved.

5.3 Tekes and service innovation

Services are an increasingly important part of (western) economies. In OECD countries, services provide approximately 70% of GDP, of which 50% are ‘market-services’ and some 20% are ‘non-market’ services (including government). Finland has a somewhat lower total services percentage (approx. 42%) and a somewhat higher ‘non-market’ part (23%)49.

Also in industrial sectors, services are very important and offer opportunities to improve revenues and/or reach new markets. At present, services are often hidden in gross-profit but there may be large earning issues in spare parts, software development, maintenance, etc. Intensified global competition and the economic crisis have increased the importance of service-based R&D and innovation activities as a new source of growth for firms, industries and national economies50. Development of services (service innovation) is a major source of productivity growth.

Services innovation can be defined as “a new service experience or service solution in one or several of the following dimensions: new service concept, new customer interaction, new value system, new revenue model, new organizational or technological service delivery system”. Services innovation is not about optimising products but often about optimising manpower and behaviour. Services innovation is therefore often multidimensional and can have many different forms. In some cases it can be a new service product (e.g. a new kind of insurance), in other cases a renewal of

49 Source: OECD 2012; figures relate to 2008.
50 Knowinno 2012.
a service process. Sometimes technology is used (often not per se state-of-the-art technology), often not. The process of innovation in companies from the service sector differs from that of more technology-orientated sectors. Simplified: innovation in the industry often focuses on the manipulation of matter, while innovation in service sectors is in many cases about learning from and with customers. Innovation processes in service companies therefore are often embedded in a different, less formalised way (no departments or divisions are set up explicitly for innovation or R&D purposes).

Because of this, traditional government support for R&D often does not support services innovation. Finland was one of the first countries to recognise this in the 1990s. The 2002 strategy of Tekes identified knowledge intensive services as an area of future interest. The emphasis was in 2002 very much on technology (knowledge intensive services, manufacturing related services and technology based services). Since then, there has been activity in Tekes on three different levels related to service innovation:

- At project level (supporting projects in the area)
- At programme level (with various Tekes programmes)
- At strategy level (e.g. by means of fostering international contacts such as the EPISIS project and translating these into Tekes policies)

The 2005 strategy of Tekes identified services innovation as a catalyst for modernisation. The focus was broadened from technology-based services to innovation-based service concepts and public services (including technology-based service innovation). In 2006 a specific programme was launched (SERVE) and Tekes mission statement and organisation were changed, so that services were explicitly made visible. When EU state aid rules also changed because of Tekes activity, support for the service component in projects became possible.

Since 2008, investments in the service sector from Tekes (excluding service innovation in industry) have been larger than investments in industry.

Several evaluations of recent programmes developing new services conclude that results have been rather modest. However, the first specific programme on services, Serve (2006-2013), has not been evaluated yet and many companies indicate that services development is only in its infancy stage and see large opportunities in service innovation to move from price competition to competition on how well customer needs are fulfilled.

While Tekes still has the image of a technology funding agency, it is doing more than that now and it has a much broader approach than earlier. Examples of what is supported (in SMEs) are IPR/patenting, business analysis (when there is not yet a product: is this an opportunity? Should we start an R&D project?), proof marketing of products under development, etc.

Further opportunities may be in service innovation in sectors with limited technology intensity (e.g. retail) but technology and services are not opposites. Technology should be a platform for services, not a product that is sold as a service.
There may be even more opportunities in new services areas: use of data, knowledge intensity, importance of intangibles and moving from owning to using. Added value is less and less in hardware but more in knowledge about particular processes.

Tekes is doing the right thing in the area of service innovation and is a leader in European policy perspective. They continue along the same lines but they should:

- **Use the wider approach in services development within Tekes.** Service development methodologies have a strong focus on user interaction and this approach could be wider used, also in more traditional sectors and markets. The policy that service innovation becomes visible in every Tekes programme and not only separate service programmes is aiming at that. More rotation of personnel in Tekes could further serve the purpose to spread the service model thinking.

- **Communicate more about this approach and stimulate public discussion in this area.** Tekes has been successful in communicating the services approach towards industrial businesses but not to the traditional service sector.

- **Have more attention for supporting the internationalisation of services as well as for global developments (including making funding for foreign parties possible).**

### 5.4 Tekes and work place innovation

Like in service innovation Tekes also has a central role in work place innovation (or work place development: WPD). Finnish interest in workplace development started in the mid-1990s when a new initiative National Workplace Program was established in the Ministry of Labour. This programme lasted 2x4 years and was extended in 2003 for another 6 years (with increased resources). Like in service innovation, technology is not central: here the employee drives the innovation. Projects are on work processes, work organisation, supervisory work, working methods, networking with the aim of increasing productivity and quality of working life (employee-orientated).

There was an overlap between the funding in the NWP activities and Tekes activities as they were funding the same companies. It was quite natural then to shift the activities from the Ministry to Tekes (and especially since the governing Ministries merged as well). At the same time there was much discussion to shift innovation policy from a technology focus and increase service innovation and workplace innovation aspects. The model was Vinnova in Sweden. They had a working life department and it was natural to integrate the WPD activities in Tekes to create a more broad-based innovation policy. In the beginning, the WPD group continued carrying out the activities they had taken with them from the Ministry but the workplace development programme ended at the end of 2010. The WPD people now work in different branches (sectors) in Tekes and are involved at the same time in some Tekes programmes as well as preparing a new Tekes programme that is
focusing on some aspects of workplace organisation (starting in March 2012). In line with the new strategy of Tekes, there is a stronger focus on intangible innovation, including the work processes. The new Tekes strategy fits WPD better.

Points for attention are comparable for WPD as for services innovation. They continue along the same line but should:

• Communicate more about this approach and stimulate public discussion in this area.
• Use the wider approach in WPD within Tekes. WPD should not, like services innovation, be in separate programmes but should be very visible in every Tekes programme.
• An additional issue is the support for WPD in companies that do not aim for international markets. These companies are not in the target group of Tekes but WPD may be a very good start for them to innovate.

5.5 Tekes, demand and user-driven innovation; public sector innovation

In the last few years there has been more and more attention on the demand-side of innovation. Involving users and interaction with public and or private users (‘user-driven innovation’) is considered essential for the dynamics in innovation systems51. More recently, this has also translated into more attention on the policy side of ‘demand-driven innovation’, defined by Edler & Georghiou (2007) as: “a set of public measures to increase the demand for innovations, to improve the conditions for the uptake of innovations or to improve the articulation of demand in order to spur innovations and the diffusion of innovations”.

Also in Finland attention on demand and user-driven innovation has increased, and according to Breznitz et al. (2009), user-based innovations take place in 25% of Finnish companies (59% of the Finnish companies use information from or about users for their innovation; for the others, user information is not necessarily useful).

Finnish innovation policy has, however, been very much supply-based and in the recent innovation strategy, ('Demand and User-driven Innovation Policy', 2010) demand and user-driven innovation policy was identified as a key policy area to be developed. The key elements of demand and user-driven innovation policy in this plan are: competence development, regulatory reform, new operating models for the public sector and development of incentives.

In recent years, more and more attention has been paid to the demand side of innovation internationally. In Finland, a 'Demand and User-driven Innovation Policy' has been developed, consisting of: competence development; regulatory reform; new operating models for the public sector and development of incentives.

51 Wintjes, 2012.
The role of Tekes in user-driven innovation is, according to shareholders in the field, clear and is to promote user-producer interaction by taking user involvement into account when evaluating projects.

In ‘demand-driven’ innovation according to stakeholders, Tekes role should focus on industry and help industry to create business.

A specific form of demand-driven innovation is public sector innovation. There are already successful examples of Tekes involvement in public sector innovation, e.g. in implementing energy consumption reduction measures and sustainable energy in buildings. Here consistent support for R&D, promoting interaction between regulators, forerunners and users and demand side measures like experiments, creation of lead markets and procurement were important support options that have both contributed to the development of new products and services as well as to the realisation of the public goal of energy consumption reduction. In public sector innovation Tekes seems to be able to play a role on the supply side (supporting industry in creating solutions). On the demand side, Tekes can only play a role when the problem owner(s) on the government side (here the Ministries of TEM and Environment) have a clear goal that can be explained to industry. In cases where goals are not clear (e.g. at present in health care policy) it is the task of the problem owning ministry to set clear goals first, only thereafter can Tekes play a role on the demand side.

Tekes has taken that into account in its new strategy.

5.6 Influence of a fiscal support programme for R&D personnel on Tekes

In Finland there has never been fiscal support for R&D. Within a short time however, a new fiscal instrument will be introduced. Although a full ex-ante evaluation of this new scheme is outside the scope of this evaluation (and there is much debate about the effectiveness and efficiency of fiscal R&D support), it seems that the imagined Finnish fiscal scheme, aiming to support companies in hiring R&D personnel, with fairly low support ceilings per company level, will not heavily interfere with Tekes interventions. The scheme will primarily be attractive for companies with limited R&D capabilities that are therefore outside the scope of Tekes target group. It may even have synergy with Tekes because of this other focus and may help to bring companies into the Tekes target group that are not yet there.

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52 Workshop for this evaluation on demand and user-driven innovation policy
6 Relation of Tekes with other support organisations in the Finnish system

In order to support science, innovation and entrepreneurship, Finland has many public players creating, at least at first glance, a rather complex support system. At the national level there are relations with:

- The Academy of Finland (financing basic research)
- TEM agencies, including:
  - Finnvera (a government bank for guarantees and financing)
  - Finpro
  - Invest in Finland (focusing on outward and inward internationalisation)
  - Finnish Industry Investment (a public Venture Capital provider)
- Sitra (the Parliament agency)

There is also a strong role in innovation and entrepreneurship policy for local and regional governments. Tekes is supporting this role by its participation in the regional ELY-centres.

6.1 National

6.1.1 Academy of Finland

The Academy of Finland's mission is to finance high-quality scientific research, act as a science and science policy expert and strengthen the position of science and research. The Academy works to contribute to the renewal, diversification and increasing internationalisation of Finnish research. Its operation covers the full spectrum of scientific disciplines.

The Academy funds research annually with €320m (2012). Each year the Academy receives funding applications worth €1.1b. Funding is provided for research projects, research programmes, Centres of Excellence in research, research posts, foreign visiting professors' work in Finland, researcher training, international networking and research collaboration between universities, research institutes and business companies. Each year Academy-funded projects account for some 3,000 researcher FTEs at universities and research institutes.

Tekes funding for the public research community is €250m (2010) but mainly focusing on the technical and applied sciences. For these sciences, Tekes funding is larger and more important than Academy funding. Professors from these areas have to compete with all other proposals in the Natural Sciences area.
The division of attention between Tekes and the Academy is clear for those involved. Whether the budget division between curiosity-driven research (Academy) and value-driven research (Tekes) is correct is more a political question than a scientific one. The benchmark in the Netherlands shows an extreme where the role of curiosity-driven research is, from 2012, reduced to almost zero (apart from university base funding). Whether this is the way to go remains to be seen.

Some 10-15 years ago, Tekes and the Academy had joint programmes (e.g. cluster programmes) but this type of strategic cooperation has disappeared (apart from the FiDiPro programme). Opportunities for such cooperation might, however, exist in complementing SHOKs with more fundamental Academy programmes.

In practice there is a lot of collaboration on the ‘work floor’ based on personal relations. For example, when the Academy of Finland set up a nanosciences programme, the manager worked together with the Tekes manager – who also set up a Tekes programme but more applied – which ensured that the timing of both programmes was aligned. Furthermore there are Tekes representatives in supervisory Boards of Academy programmes, there are some joint international cooperations (e.g. with Japan and NSF), as well as joint representations in international management committees. At the management level, Tekes and the Academy meet once a year. The DGs meet perhaps three times a year.

Although from the funding side cooperation is not really necessary (the professors know how to get money and adapt their proposals to either Tekes or Academy needs), a joint approach towards international collaboration (including EU) and towards third world countries (e.g. Latin America) would certainly be more efficient and possibly more effective as well. Tekes and the Academy now separately develop Finnish collaborations, which are therefore scattered and subcritical.

Although it would go too far to say that both organisations could be easily merged, there clearly is a need to have more joint research programmes. Finland needs better joint-up research and innovation policy as is more common in other Nordic countries.

6.1.2 TEM agencies: Finnvera

Finnvera’s mission is to strengthen enterprises’ competitiveness by granting financing and thereby to promote employment and regional development. Finnvera provides financing for the start, growth and internationalisation of enterprises and for protection against export risks. Finnvera reinforces the capacity and competitiveness of Finnish enterprises by offering loans, domestic guarantees, venture capital investments, export credit guarantees and other services associated with the financing of exports. With this focus on start-ups, growth and internationalisation, Finnvera has a similar focus as Tekes. However, where Tekes focuses on innovation and forerunners, Finnvera focuses on financial aspects and takes into account all companies with financing needs.
6.1.2.1 CUSTOMER OVERLAP

Due to Finnish bank secrecy rules we were unable to conduct an analysis of overlap between Finnvera and Tekes customers internally. Representatives of Finnvera, however, have conducted such an analysis for us. This comparison relates to the profiles of customers of both organisations during the five-year period from 2007 to 2011. In total, Finnvera served 27,574 customers in this period, over five times more than Tekes, which served 5,387 customers. The two customer bases share 1,695 customers, which constitute 31.5% of Tekes customer base and 6.1% of Finnvera’s customer base.

**Figure 23. Customer base profile by size – Tekes, Finnvera and the overlap**

<table>
<thead>
<tr>
<th>Size category</th>
<th>Number of customers – Tekes</th>
<th>Number of customers – Finnvera</th>
<th>Number of customers in common</th>
<th>Share of Tekes customers that are also Finnvera’s customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro, &lt;10 employees</td>
<td>2,633</td>
<td>23,970</td>
<td>940</td>
<td>35.7%</td>
</tr>
<tr>
<td>Small, 10-49 employees</td>
<td>1,419</td>
<td>3,016</td>
<td>552</td>
<td>38.9%</td>
</tr>
<tr>
<td>Medium, 50-249 employees</td>
<td>467</td>
<td>499</td>
<td>170</td>
<td>36.4%</td>
</tr>
<tr>
<td>Large, over 249 employees</td>
<td>784</td>
<td>89</td>
<td>33</td>
<td>4.2%</td>
</tr>
<tr>
<td>Unknown</td>
<td>84</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>5,387</td>
<td>27,574</td>
<td>1,695</td>
<td>31.5%</td>
</tr>
</tbody>
</table>

Source: Tekes and Finnvera customer databases, 2012

Figure 23 represents the profile and overlap of the two customer bases by the size of the customer organisations. It shows that more than one-third of all SMEs (with less than 250 employees) who were supported by Tekes also had involvement in Finnvera’s initiatives. Finnvera’s limited focus on large enterprises (only 0.3% of all Finnvera’s customers are large enterprises) resulted in a much smaller overlap for this group of companies – only 4.2% of all Tekes large customers are also financed by Finnvera.

Figure 24 shows profiles of Tekes and Finnvera’s customer bases by type of organisation. It suggests that the majority of organisations common to both of Tekes and Finnvera are ‘limited liability companies’. A third of all such companies funded by Tekes also received funding by Finnvera. A relatively large share (45.5%) of the 33 companies in the category of ‘Cooperative, General partnership, Limited partnership’ that were funded by Tekes were also financed by Finnvera. The overlap was the smallest for the organisations in the category of ‘Private entrepreneur, Estate, Municipality, Public foundation, Registered association, Unknown’. Only 4% of them received funding by both of the funders.

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53 Finnvera uses the same categorisation for organisation type as Tekes, but for this analysis Finnvera chose to consolidate some categories with low counts to prevent possible exposure of individual customers.
Figure 24. Customer base profile by organisation type – Tekes, Finnvera and the overlap

<table>
<thead>
<tr>
<th>Organisation type</th>
<th>Number of customers – Tekes</th>
<th>Number of customers – Finnvera</th>
<th>Number of customers in common</th>
<th>Share of Tekes customers that are also Finnvera’s customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative, General partnership, Limited partnership</td>
<td>33</td>
<td>2,455</td>
<td>15</td>
<td>45.5 %</td>
</tr>
<tr>
<td>Limited liability company</td>
<td>5,030</td>
<td>16,030</td>
<td>1,667</td>
<td>33.1 %</td>
</tr>
<tr>
<td>Private entrepreneur, Estate, Municipality, Public foundation, Registered association, Unknown</td>
<td>324</td>
<td>9,089</td>
<td>13</td>
<td>4.0 %</td>
</tr>
<tr>
<td>Total</td>
<td>5,387</td>
<td>27,574</td>
<td>1,695</td>
<td>31.5 %</td>
</tr>
</tbody>
</table>

Source: Tekes and Finnvera customer databases, 2012

Figure 25 provides aggregated data received from Finnvera comparing profiles of Tekes and Finnvera’s customer bases by industrial branch. The categories are in some cases aggregations of several Industrial Branch categories due to the nature of output provided by Finnvera. The table is also not completely consistent with the Tekes customer database provided to the study team.

The areas of most significant overlap relative to the size of Tekes customer base are (i) Manufacturing, (ii) Electricity, gas, steam and air conditioning supply, (iii) Water supply; sewage, waste management and remediation activities and (iv) Information and communication, all with more than 30% of Tekes customers also receiving financing from Finnvera.

It can be concluded, somewhat surprisingly, that the overlap in customers between Tekes and Finnvera is rather limited, only 31.5% of Tekes customers are also Finnvera’s customers. This is valid for all sized classes of customers, types of customer and across all sectors. This suggests that an exchange of information on customers and a joint offering of services between Tekes and Finnvera might offer opportunities for both to broaden their customer base.
### Figure 25. Customer base profile by Industrial Branch 1 – Tekes and Finnvera and the overlap

<table>
<thead>
<tr>
<th>Branch code (Aggregated level 1)</th>
<th>Number of customers - Tekes</th>
<th>Number of customers - Finnvera</th>
<th>Number of customers in common</th>
<th>Share of Tekes customers that are also Finnvera’s customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing and Mining and quarrying</td>
<td>41</td>
<td>726</td>
<td>11</td>
<td>26.8%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1,533</td>
<td>4,433</td>
<td>717</td>
<td>46.8%</td>
</tr>
<tr>
<td>Electricity, gas, steam and air conditioning supply</td>
<td>77</td>
<td>307</td>
<td>25</td>
<td>32.5%</td>
</tr>
<tr>
<td>Water supply; sewage, waste management and remediation activities</td>
<td>43</td>
<td>137</td>
<td>19</td>
<td>44.2%</td>
</tr>
<tr>
<td>Construction and Wholesale and retail trade; repair of motor vehicles and motorcycles</td>
<td>587</td>
<td>8,476</td>
<td>169</td>
<td>28.8%</td>
</tr>
<tr>
<td>Transportation and storage and Accommodation and food service activities</td>
<td>92</td>
<td>3,440</td>
<td>20</td>
<td>21.7%</td>
</tr>
<tr>
<td>Information and communication</td>
<td>1,170</td>
<td>1,136</td>
<td>371</td>
<td>31.7%</td>
</tr>
<tr>
<td>Financial and insurance activities and Professional, scientific and technical activities</td>
<td>1,149</td>
<td>3,293</td>
<td>279</td>
<td>24.3%</td>
</tr>
<tr>
<td>Administrative and support service activities and Public administration and defence; compulsory social security + Education</td>
<td>269</td>
<td>1,786</td>
<td>39</td>
<td>14.5%</td>
</tr>
<tr>
<td>Human health and social work activities</td>
<td>174</td>
<td>1,442</td>
<td>26</td>
<td>14.9%</td>
</tr>
<tr>
<td>Arts, entertainment and recreation, Other service activities, Activities of households as employers; undifferentiated goods and services-producing activities of households for own use and Activities of extraterritorial organisations and bodies</td>
<td>116</td>
<td>2,398</td>
<td>19</td>
<td>16.4%</td>
</tr>
<tr>
<td>Industry unknown</td>
<td>136</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>5,387</td>
<td>27,574</td>
<td>1,695</td>
<td>31.5%</td>
</tr>
</tbody>
</table>

Source: Tekes and Finnvera customer databases, 2012

### 6.1.2.2 COMPARING TEKES AND FINNVERA: THE CUSTOMER VIEW

Approximately go Tekes customers compared Tekes performance with that of Finnvera. This is only a small part of Tekes customers (and an even smaller part of Finnvera customers) so the results are not statistically significant. However only a minority of respondents rated Tekes as better than Finnvera in terms of ease of access to support services. Given that it is Tekes rather than Finnvera’s customers that are providing this feedback, these findings strongly suggest that Finnvera’s financing services are more accessible than those provided by Tekes.
6.1.2.3 COMPARING TEKES AND FINNVERA: THE ‘PROGRAMME’ POINT OF VIEW

Tekes and Finnvera both have specific goals related to start-ups, growth and internationalisation.

- Tekes targets start-ups with specific programmes (VIGO), providing management support as well as project financing, while Finnvera supports with specific VC funds for the seed and start-up phase.
- Tekes targets growth companies, both young (YIC) and more mature (projects and programmes), mainly with innovation finance. Finnvera supports this group of customers with business loans (Regional financing and Financing for Growth).
- Internationalisation is a central issue in Tekes (see below, chapter 7), as it is in the growth programme of Finnvera.

The programmes of both organisations clearly show an overlap in goals and possibly also in their target group. The way in which the instruments work is, however, rather different. According to Finnvera, ‘It’s better to lend than to grant’. If you grant, then the beneficiaries start to treat the money as revenue and to optimise against it. Finnvera loses money on the 1000 growth companies and a little bit with the micro-enterprises; the more traditional companies give a more positive result.

From the interviews and the focus group on start-up and growth we have the impression that the target groups know the differences and see the synergies for themselves. They do not see the overlap as a large problem.

6.1.2.4 SYNERGIES

Cooperation between Tekes and Finnvera is there, but incidentally and structural cooperation seems to be in its infancy. There is a strong reason for keeping Finnvera and Tekes separate. The intervention rationale for R&D support (perspective underinvestment in R&D because of spill-overs) is different from the rationale for financing companies in the commercial stage (e.g. perspective of short term horizon and risk perception of commercial finance suppliers inadequate) and they may even conflict. It is not easy to communicate that an organisation that for the right reasons has given R&D support does not give company financing to the same company (also for the right reasons, but different ones).

Tekes and Finnvera however might benefit from a closer, more strategic cooperation. Possible synergies include:

- In customer segmentation and joint or coordinated customer approach, including a single entry point for business support in the Finnish system.
- In information exchange: Finnvera is strong in the financial assessments of its clients, Tekes is stronger in the assessment of the business perspective of future investments.
- In skills: The Finnvera people are more focused on financial performance and the Tekes people on technology but you need both, at least for some customers.
• In location: The existing regional network is not customer-orientated (Finnvera has its own offices, Tekes is operating from the ELY centres; see below). For customers it would be advantageous for the two to be closer.
• In systems: both organisations have administrations, HR; communications; financial and IT systems.

6.1.3 TEM agencies: Finpro and Invest in Finland

Day-to-day cooperation with Finpro and Invest in Finland (the two will merge) is good but a more open and strategic cooperation would benefit both. The private role of Finpro and the fact that they operate on a commercial market may, however, hamper the open cooperation (see also 7.4 in the chapter on the role of Tekes in internationalisation).

6.1.4 TEM agencies: Finnish Industry Investment Ltd.

Finnish Industry Investment Ltd. (FII) is a government-owned investment company. It promotes Finnish business, employment and economic growth through venture capital and private equity investments. FII invests in Finnish companies, both directly and through private equity funds. It invests in rapid growth, internationalisation, spin-offs, major industrial investments, as well as sectoral, corporate and ownership restructurings. Although government-owned, FII is operating on a commercial basis. In order not to disturb the market for VC they work hand-in-hand with private investors from Finland and abroad, to share risks while boosting the availability of funding, investment expertise and networks.

In the area of start-ups they do have a significant overlap in their customer base with Tekes; many of their (tech-related) ventures have also had Tekes project support. By operating commercially and owning equity, the FII role is completely different from Tekes. Customers seem to recognize this. Cooperation between both parties is generally good. In our opinion, cooperation may be somewhat more ambitious and formalised and may include the Finnvera VC funds as well.

6.1.5 Sitra

Sitra is an independent public fund that reports directly to the Finnish Parliament. It is aimed at building a successful Finland for tomorrow. Sitra’s activities promote new operating models and stimulate business that aims at sustainable wellbeing. Sitra’s strategy includes developing new ideas of what the good life is, finding operational models that build a new kind of society and boosting sustainable business operations. Sitra identifies the need for social change and enables that change. Sitra carries out practical experiments, compiles cross-boundary networks and develops and finances business operations. Since 2004, fixed-term programmes have formed the
core of Sitra’s operations. During 2012, a project-based organisational model will be adopted that focuses on three themes:

• Sustainable lifestyles and smart use of natural resources
• Renewable leadership and well-being services
• Bottlenecks of economic growth and new opportunities

Sitra funds its operations from the returns of endowment capital (present value approximately €700m) and capital investments. Sitra receives no funding from taxes or the state budget. Sitra is initiating and enabling change projects and, as part of these projects, also invests in (start-up) companies that are enabling the change. Sitra is therefore also an important player in innovation policy. Although public, it is independent from the government and sets its own agenda. Funding means are limited and therefore there is no confusion with the funding role of Tekes. In its role of change agent, however, there may be more lack of clarity of roles but in practice there is good cooperation and conflicts do not occur (according to both parties).

The cooperation is, however, not at a real strategic level and we think that here also, more structured communication and strategic cooperation may increase impact, especially where broader (not entirely economic) societal issues are addressed.

6.2 Regional: ELY centres

Local and regional governments traditionally have a strong position in Finnish politics. In the area of innovation and entrepreneurship policy, the regions are rather important as well. They have strong powers in the area of business support and also EU regional funds are distributed regionally. The system for local innovation support is scattered and complex. In the context of the evaluation of Tekes, the ELY centres are important, because these function as regional Tekes offices.

6.2.1 Goal of ELY centres

The ELY centres – the Centres for Economic Development, Transport and the Environment – manage the regional implementation and development tasks of the state administration. There are 15 ELY Centres that are tasked with promoting regional competitiveness, wellbeing and sustainable development, as well as curbing climate change.

The ELY centres have three areas of responsibility:

• Business and industry, the labour force, competence and cultural activities
• Transport and infrastructure
• The environment and natural resources

The ELY centres operate within the administrative sector of the Ministry of Employment and the Economy. In addition, their operations are steered by the Ministry of the Interior, the Ministry of Agriculture and Forestry, the Ministry of the
Environment, the Ministry of Transport and Communications and the Ministry of Education and Culture.

The ELY centres have in total 4400 employees. Only part of these are involved in innovation. The amount of money available for regional grants for (innovation in) companies from the ELY centres is about €140m/y54.

6.2.2 Organisational relation of ELY centres with Tekes

The regional offices of Tekes are located in the ELY centres: 87 Tekes experts are located across the country in the ELY centres and although formally employed (and paid) by the ELY centres, they are operationally a part of Tekes and are working to achieve the Tekes strategy. They are part of the Tekes management system and have personal targets, set by Tekes (based on the Tekes strategy, as with formal Tekes employees). This is a very complex arrangement.

The expertise of these people is not only used in their own region but all over Finland, depending on the needs. Typically the experts work 50% in their own region and 50% outside. Managers from the Tekes units in the ELY centres also have tasks from ELY centres, some coming from Tekes, others have a regional background. At unit level the Tekes managers spend about 50–70% of their time on Tekes work, the rest is management and reporting within the ELY centre.

6.2.3 Customer view

Our survey revealed that 61% of Tekes customers agree that it is important to be able to access Tekes services at a local/regional level. A further 17% disagreed, indicating (presumably) that this is not an important matter for them, while the remaining 23% of customers indicated that they are undecided or have no opinion on the matter.

The more innovative organisations within our sample were less likely to see a need to access Tekes services at a local or regional level than was the case for the less innovative companies.

Tekes customers were asked to indicate how Tekes performance compares with other support providers along a number of dimensions. Respondents were asked to state whether Tekes performance is better, the same or worse in terms of (i) the relevance and usefulness of the support services provided, (ii) ease of access to those services, and (iii) the quality of the agency’s procedures and personnel. Respondents were also asked to indicate which agency or agencies they are comparing Tekes with when making their assessments.

Approximately 160 of Tekes customers compared Tekes performance with that of the ELY centres specifically, with the following results:

54 Information Tekes, interview Antti Heiskanen, 24-1-2012
• The vast majority of the respondents (69%) rated Tekes services as more relevant than those offered by the ELY centres. Just 12% rated the ELY centres as offering more relevant services than Tekes.

• An even greater proportion (73%) rated Tekes services as more useful than those provided by the ELY centres. Just 7% of respondents rated the services provided by ELY Centres as more useful than those provided by Tekes.

• Tekes also received very positive ratings for the quality of its personnel in comparison with those employed by the ELY centres. Over two-thirds (69%) rated Tekes personnel as being of a better quality than those employed by the ELY centres, while just 8% indicated that in their opinion the reverse is true.

• The quality of Tekes procedures was also highly rated by Tekes customers in comparison to those of the ELY centres. In this case 59% of respondents rated Tekes procedures as being better than those of the ELY centres, while just 10% stated that the opposite was true.

• Only a minority of respondents rated Tekes as better than the ELY centres in terms of ease of access to support services. Here 42% of Tekes customers rated Tekes services as easier to access than those of the ELY centres but 25% disagreed and indicated that in their view ELY centre services were easier to access than those of Tekes. It should be noted that this does not seem to relate to the regional dimension alone, as Tekes received fairly low ratings for ‘ease of access to services’ as compared to other national agencies, such as Finnvera.

6.2.4 Role of Tekes in the regions, importance of regions to Tekes

According to various respondents in the ELY centres, Tekes impact on the development of regional innovation systems has been immense. Tekes provides for the regions’ huge expertise and connections to the global systems. Tekes also provides credibility to the company, because the Tekes people in the ELY centres are directly involved in the funding discussions. The Tekes people in the ELY centres would probably leave the region when not connected to Tekes anymore (“the work is not so interesting when a link to Tekes would be missing”).

On the other hand the presence in the ELY centres provides Tekes with a good insight in the regional situation: information on companies and on the business environment, which is to some extent region-specific. Without a regional network it would be more difficult for Tekes to identify the regional potential. There are many companies that do not know Tekes yet. ELY centres can operate as a sieve, to pinpoint those clients that are within Tekes target group. This can be done better when there are people from the Tekes organisation in the ELY centres.

Important for a good functioning regional representation of Tekes in the ELY centres is that regional and national innovation strategies are aligned. This is not always the case. One main problem for Tekes is that ELY centres are not (totally)
involved in industrial branches and competence areas: they are regionally-driven. On the other hand, the Tekes people in ELY centres may be too much sector/competence-driven (and not put regional interest first). The conflict of interest may also be a problem at a personal level for the staff and requires complex management coordination processes.

The new Tekes strategy (focusing on companies that operate internationally) might increase the tension between ELY centres and Tekes, because this strategy reduces the number of companies in the Tekes target group and therefore also the number of regional companies in the target group. The already very small units of Tekes people in ELY centres in some regions will then become even smaller and will often be sub-critical, not able to provide the support that Tekes wants to offer its customers. (Critical mass is estimated at 10-15 persons per Tekes unit).

Some interviewees acknowledge this:

*If you want Tekes to be supporting the elite only, they don't need regional network.*

The optimal configuration of the regional representation of Tekes requires separate study but we expect that reducing the number of regional representations from five to seven (spread around the country, e.g. in Turku, Tampere, Kuopio, Oulu, Jyvaskyla59) will be a good way to advise companies in the regions in more effective and efficient ways. In this study the organisational relationship between Tekes and the ELY centres, as well as the role of cooperation with Finnvera and Finpro regional offices (which are at present outside the ELY centres) should also be considered. Cooperation with the ELY centres that have no Tekes representation anymore should also be looked at, so that they keep their function as an antenna for Tekes to detect regional companies for the Tekes target group and keep connected to the national support system.

### 6.3 Customer views on the Finnish innovation support system

Tekes customers were asked to indicate whether they agreed or disagreed with a number of statements about the Finnish innovation support system (in general, as opposed to specific features of Tekes itself). The results obtained are presented in Figure 27 and reveal a number of important points:

- Just more than half of Tekes customers (52%) believe that they have a clear understanding of what support services are available in Finland, although roughly a quarter seem unsure and the remaining quarter believe that they do not have a good understanding. This suggests that even among organisations

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59 Together with the Uusimaa region the regions these cities are located in cover 77% of present Tekes clients (chapter 2.3.5)
that are actively receiving support, there is a significant proportion that could be better informed about the full range of services on offer

- There are lower levels of understanding as to the roles of the various different service providers. While 39% of Tekes customers stated that they have a good understanding, most are unsure (31%) or indicate that they do not have a clear understanding (31%). This again suggests that the roles of the different providers could be clarified to customers

- A similar profile of responses was obtained in relation to whether the public and private support systems are clearly separated in Finland. Here 35% of Tekes customers agreed that there is a clear separation but a similar proportion (34%) were unsure and the remainder (31%) do not agree that the two systems are clearly separated

- Tekes customers are fairly evenly split as to whether they feel there are too many support agencies in Finland. Over a third (39%) agree that there are too many agencies, 32% do not agree, while 29% are unsure. There is no clear consensus on this but clearly many of Tekes customers feel that the system of agencies could be rationalised to some extent

- One area where a ‘majority’ (51%) of Tekes customers agree is that it would be useful for companies to have a single entry point for business support. While this idea attracts a significant amount of support among Tekes customers, almost one third (29%) of customers would not find this helpful

- Finally, when asked whether all of the forms of support that their organisation might need are available, only 26% agreed, as compared to 43% that disagreed and the remainder were unsure. This means that a significant proportion of Tekes existing customers feel that the national support system is in some way not providing all of the forms of assistance that they feel they could benefit from

The more innovative organisations within our sample were significantly more likely than the less innovative ones to state that they have a clear understanding of (i) the support services available in Finland and (ii) the roles of the different support providers. However, there were no significant differences in relation to the other questions covered in Figure 27. Unsuccessful applicants (non-customers) did not provide significantly different ratings to Tekes customers on any of the questions covered in Figure 26.
Tekes customers were also asked whether they agreed or disagreed with a number of statements concerning greater specialisation of the support agencies in Finland.

The results are shown in Figure 27 and reveal a generally low level of support for ‘radical’ changes that would see individual agencies focus (i) mainly on a single branch of industry, (ii) only on one type of customer, (iii) only on a specific geographical level (e.g. local, regional, national), or (iv) only on one type of support service. Of the four forms of specialisation there was most support for specialisation around the types of service offered but even here less than a third of Tekes customers agreed that this would be helpful.
Respondents to the surveys were asked for qualitative suggestions as to how the Finnish support system could be better focused and organised from the perspective of their own organisation. The main comments received are summarised as follows:

- Many respondents share the view that the Finnish business support system currently is complex and hard to understand – a real “support jungle” with significant administrative costs involved in its negotiation.
  - There are (too) many support organisations administering a wide variety of instruments. The organisations’ roles are often unclear for customers.
  - Several commentators see a one-stop-shop concept as a solution to the current situation and avoid overlapping activities. However, others clearly question whether this is a feasible approach and see certain rationality in the existence of different (specialised?) support organisations.
  - Some commentators see a need to improve cooperation between support organisations. Related to this, customers (depending on their needs) should be guided proactively to use the most applicable services available no matter which organisation provides them but an element of ‘competition’ between agencies seems to prevent this happening to the optimum degree.
  - Notwithstanding this, it is interesting to note that some respondents seem to have no difficulties in comprehending and manoeuvring through the support system and do not see any significant problems with it.

- Following on from the above, there does seem to be a clear need to clarify the roles between public organisations supporting innovation and businesses (Tekes, Finnvera, Finpro, etc.) and to ensure effective signposting between them.

- There is need for support and guidance in the identification and use of international funding opportunities (e.g. EU funding).

- Some commentators see a gap between the ‘development phase’ and the point of commercialisation that is particularly difficult for small firms and start-ups to bridge. Some commentators refer to the “the valley of death” meaning that for new companies, third-party support is often needed to get off the ground or to move from concept to prototype.
  - (Domestic) private venture capital companies have a role to play here, alongside public actors.
  - Some commentators pointed to a lack of risk funding as a serious if not the most serious problem; “often when there is no local lead investor it is hard to attract international VCs to invest in Finnish firms”.
  - There were some suggestions that domestic VC companies expect Tekes to commit to fund a start-up before they are prepared to render an investment decision and one can question whether the situation should be the other way round.
• The support system should not be focused only on technical innovations/fields but should also cover business planning, business innovations and creative industries to name just a few
• Commentators also pointed to the need to support firms with aspects such as product launch, marketing, branding and so on.

6.4 Conclusions with respect to the Finnish support system

The Finnish Innovation support system is rather complex with many players. After the merger of Invest in Finland with Finpro the division of tasks at the national level is, for insiders, clear. Further mergers might distort the system of checks and balances between the organisations and their (different) missions (e.g. Tekes/Academy) and might in some cases even lead to conflicting goals within one organisation (e.g. Tekes/Finnvera). Further mergers would also even further focus the attention on internal processes at the agencies, instead of focusing on serving customers.

Although the work division between the agencies is clear for insiders, the complexity of the system makes it unclear for outsiders where to go to for their needs for support. Explanation of roles and good signposting from one organisation to another is therefore needed, which is not only the task of individual agencies but also of TEM as an owner or principal of most relevant players. TEM should implement within its agency system (including the ELY centres) a cooperation structure, consisting of a clear division of tasks, a comprehensive customer segmentation, good mutual knowledge of each others’ support instruments and an effective way of signposting to each other.

Tekes has also now interfaces with many organisations in the system. On these interfaces there is (often good) operational cooperation but there seem to be good opportunities for strategic and operational synergies that are presently not exploited. Tekes should be more open to these opportunities and should develop far more open and strategic relations with other agencies in the Finnish system.

• With the Academy, discussions should be started on joint research programmes and other strategic ways of operating, especially in the area of international science cooperation.
• For support to start-ups, the cooperation between Tekes, Finnish Industry Investment and the Finnvera VC funds should be more formalised and more ambitious in its support role.
• As well with Finnvera, more information on customers should be exchanged and analysed in more detail to provide better support. Operational synergies should be explored and captured in skills and in systems.
• The need for (non-financial) internationalisation support is widely expressed by Tekes customers and the level of expertise of Tekes in this area is considered to be limited (see also 7.4). Finpro has this knowledge, or could probably more
easily develop this. Tekes should explore cooperation models with FinPro to make the FinPro knowledge accessible for their customers. The (partly) commercial operations of Finpro may however be a problem that must be solved first.

- With Sitra communication could be better structured at a strategic level, which may result in more strategic cooperation, especially when approaches for addressing broader societal issues are developed.

The Ministry of Employment and the Economy should support this cooperation, by providing the right incentives and support structure. Regular meetings of the Director Generals of all relevant TEM agencies especially aiming at strategic and operational synergies could be held (like in Ireland).

At regional level the Tekes network is organised in the ELY centres. Tekes has representations in all centres (except Helsinki). This regional network is very important for the regions: it gives them a direct connection to national innovation funding and provides expertise to the regions that would otherwise be difficult to get. It also connects Tekes to companies in the regions. However not all expertises of Tekes are available directly in all ELY centres, because the representations are sometimes rather small, so often outside expertise has to be used. This may be inefficient (or when outside expertise is not used) even ineffective. The optimal configuration of regional representation of Tekes requires separate study but we expect that reducing the number of regional representations from five to seven will be a good way to advise companies in the regions in more effective and efficient ways.

In this study the role of cooperation with Finnvera and Finpro regional offices (which are at present outside the ELY centres) should also be considered. Cooperation with the ELY centres that have no Tekes representation anymore should also be looked at, so that they keep their function as an antenna for Tekes to detect regional companies for the Tekes target group and keep connected to the national support system.
7 Role of Tekes in internationalisation

Tekes deliberate shift of focus towards internationalisation was consistent with the strategy set out by the (now) Research and Innovation Council and reflects the simple truth that a small open economy like Finland can only be successful by operating internationally. Most high value adding companies need to be ‘born global’ or they will have too little market knowledge to succeed.

7.1 The policy context for internationalisation

Increased international collaboration in research and innovation and the internationalisation of Finnish companies is a central element in the national innovation strategy. In order to secure high added value jobs, companies must be able to compete in the world markets. To quote the 2009 National Innovation Strategy paper:

*This means stronger incentives for international networking and risk-taking both in Finland and overseas, while ensuring that investments in innovation add value to the Finnish economy and society.*

The augmented internationalisation is part of the core business and the new segmentation of Tekes work. But it also involves Tekes role as intermediary to support Finish companies and researchers to link up with international programmes such as the European Community initiatives. To quote the 2009 National Innovation Strategy again:

*Special challenges in reinforcing participation and influence are related to e.g. research, development and innovation cooperation in the EU. While Finland is a preferred partner that participates actively in various forms of cooperation, it is not profiling itself sufficiently as an influential force or in taking the initiative.*

And the Research and Innovation Council of Finland also stressed the need for more internationalisation and stated that, “…more Tekes funding should be channelled into the type of international projects that are undertaken through close multilateral cooperation in research and innovation.”

Thus stepping up the internationalisation activities of Tekes is strongly rooted in Finland’s innovation policy priorities.

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7.2 Internationalisation in Tekes

Tekes focuses on the internationalisation of R&D and innovation activities. The main way for Tekes to promote internationalisation is through the projects it funds. International cooperation is stimulated through Tekes funding criteria and higher funding levels. Tekes has a number of bilateral R&D collaboration agreements outside the EU from which it can fund R&D collaborations with Finnish partners. In particular the US, China, Japan, Russia and Canada are targeted by the customers. In addition, Tekes operates offices abroad (in Washington, D.C., Silicon Valley, Shanghai, Tokyo and Brussels) that help Tekes clients to network either directly or indirectly.

Elements in Tekes approach to internationalisation include:

• The quantity and quality of international cooperation carried out in the projects is considered in the assessment of research projects by Tekes (alongside the overall quality of the project and the needs of economic life)
• Various costs arising from internationalisation are eligible to be covered by Tekes financing for SMEs (e.g. costs incurred by market research)
• Services provided by Tekes programmes to support access of Finnish SMEs to international value networks
• Special measures to promote the internationalisation of SMEs (e.g. the Global Access Programme (GAP) implemented in the US in cooperation with the UCLA Anderson School of Management)
• Agreements on bilateral financing activities with certain countries (e.g. Israel, South Korea, China, India and Russia)
• The Finland Distinguished Professor Programme (FiDiPro), implemented in cooperation with the Academy of Finland, aims to promote the internationalisation of research
• Country-specific application processes for research funding agreed upon with the target countries (e.g. with Singapore, Canada, Japan and the US)
• A special new RDI stage financing option for companies planning to set up operations in Finland is currently being developed with the aim of increasing the attractiveness of Finland

Tekes has responsibilities in the implementation and management of international programmes, which include the handling of communications, provision of the possible national funding contribution and (sometimes) project evaluation. Tekes also represents national interests in the planning of new European programmes and the planning of European-level preconditions for R&D activities. Tekes also hosts a unit called EU research and innovation programmes (EUTI), which has national responsibility to promote and spread information on the EU Framework Programmes (see section 7.3).

Tekes has transferred the responsibility for internationalisation from a separate Unit of International Affairs to a decentralised or ‘mainstreamed’ organisation of individuals responsible for internationalisation of the various Tekes competence
areas. The disadvantage of having a separate Internationalisation Unit was that their activities were detached from the day-to-day core business of the Tekes organisation. The philosophy of that approach was that by decentralising the internationalisation tasks, (including the liaison with EU programmes) the immediate interaction with the clients would improve as the Tekes expert can cater for the specialist needs of the competence area.

There is no separate agenda or set of milestones for the internationalisation tasks, the activities need to contribute to the overall objectives. With a stronger focus on the international growth companies, this has become an integral part of the Tekes organisation. Internationalisation of growth companies is mostly reached through trade. So the Tekes funding schemes also support activities for companies to go abroad. As one interviewee stated, while Tekes evaluated R&D projects in the past, now the experts evaluate the whole business, including the experience of the managers of the companies to conduct international business.

Another novel approach to internationalisation is by attracting foreign companies to invest in R&D in Finland. The tool used here is the ‘tentative funding decision’. Thus if a foreign firm considers investing in Finland and Invest in Finland identifies them, they can have a discussion with Tekes before their decision. Tekes can give them a tentative decision for R&D funding. This is the Finnish answer to what happens in many other countries, i.e. the ‘a priori’ promise of tax reductions. However, many of the foreign investors are in the retail sector and/or not very R&D-intensive.

The key internationalisation programme that Tekes runs is The Finnish Distinguished Professor Programme (FiDiPro), which is run together with the Academy of Finland. So far the programme has managed to attract 60 professors. This programme focuses strongly on science.

Tekes has also tried to encourage networks and clusters (e.g. some of the OSKE clusters) to operate more in the international markets and develop ties with other clusters abroad.

### 7.3 Tekes and the Finnish system of National Contact Points

An important pillar of internationalisation is formed by the activities of Tekes to improve the interaction of Finnish stakeholders with the European research programmes and other European multilateral collaboration platforms. As interviewees state, around 75% of Finnish exports go to Europe so the European market is still important despite the fact that it is stagnating.

While Finland overall is not performing badly in FP7, the participation is declining (although still above EU average) and particularly the willingness to coordinate proposals and consortia is below EU average. Particularly industry is not well represented. A leading company such as Nokia has more or less stepped out of its FP activity. Only companies in the Forestry area seem to be quite active. It is a general
problem in Europe that FP7 has failed to attract industry and SMEs but in Finland it is quite pressing. The interest in taking part in more strategic forums such as the European Technology Platforms is declining as companies see little concrete results coming out of these initiatives. So there is room for improvement to mobilise Finnish partners.

The Finnish support structure is decentralised rather than centralised and National Contact Points (NCPs) reside in a number of Finnish organisations. Tekes has always been a key organisation in this network with a responsibility to coordinate the whole Finnish network that is called EUTI (previously the Finnish Secretariat for EU R&D). To understand Tekes role better, a short sketch of the wider system to support international collaboration in R&D is necessary.

The organisations in the EUTI network are responsible for promoting information on the EU Framework Programmes. In addition, the National Contact Points (NCPs) and officials at universities and research institutes are working on communication in this field. Although Tekes is coordinating the Finnish network of NCPs, it only has 13 NCP-experts within Tekes in a network of 37 NCPs in the whole of Finland. The Academy of Finland has 14 NCPs at the moment. Where Tekes has the NCP role in more applied fields, the Academy looks after the more academic fields. In many domains (environment, health, space and ICT) both organisations have one NCP. In addition, there are NCPs at various Ministries, specific agencies and institutes and at ELY centres.

The central EUTI, which is located at Tekes, offers services to all stakeholders in companies, universities, research institutes, governmental agencies and municipalities free of charge. The EUTI has a staff of three people full time. One of these staff members is a financial expert, another a legal expert at Tekes. One of their main functions is to give general information and advice on EU R&D Framework Programmes. The office also coordinates the Finnish NCP system and monitors Finnish participation in the EU R&D programmes. The network meets four times a year to coordinate activities and share experiences. The EUTI meets every two weeks and has permanent electronic contacts with the rest of the NCP network.

Although a network of 37 NCPs for a country as relatively small as Finland seems large, most of them work part-time (typically 5-10% of their time) on EU matters and the rest of their time is spent dealing with national programmes and policies. The same holds true for the Tekes part of this network: because of the mainstreaming of internationalisation, most of the EU experts are working for the competence areas as well as conducting normal advisory roles. The central EUTI sees educating the Tekes advisors to know more about the EU programmes as its main task. There is no formal training of Tekes advisors to understand how the Brussels machine works. The EUTI team have to do the convincing of their colleagues and typically would join internal meetings and give a half hour presentation. They strongly rely on the individual Tekes advisors to take this up seriously. But in general there seems to be a reluctance to allocate too much time to EU matters. The ELY centres mostly
consider the national funding as ‘low hanging fruit’ so why bother to go through the bureaucratic hoops of an EU application?

There is a representative joint office of Tekes and the Academy of Finland in Brussels. They can offer support work for the FP network in Finland.

Both the EUTI and the NCPs provide services and training. While there was a stronger need for practical advice at the start of FP7, today the need for advice is shifting towards more strategic questions: how to influence the work programmes, how to shape the agenda of FP8? What services and training are given depends on the individual NCP. The EUTI organises big information events if there are large calls coming, typically attended by some 300 people.

In the survey Tekes customers were asked whether their organisation had applied for funding from the European Commission, Eureka, ESA or any other ‘international’ funding bodies and, if so, whether they received any advice or support from Tekes in relation to the application(s). Almost a quarter (22%) of Tekes customers stated that they had applied to international sources and almost half (47%) of these had sought advice from Tekes before applying. In just over half (53%) of these cases, customers rated Tekes expertise in relation to the funding source(s) as in line with their expectations and a further quarter (25%) indicated that Tekes expertise had exceeded their expectations. A slightly smaller proportion (22%) indicated that Tekes expertise had not lived up to their expectations.

Overall, almost two-thirds (63%) of respondents would consider contacting Tekes for assistance with acquiring international R&D funding and most of the remainder stated that they might consider contacting Tekes. Just 9% of respondents stated that they would definitely not consider contacting Tekes for advice on international funding opportunities.

Turning to unsuccessful Tekes applicants (non-customers), 16% stated that they had applied to international sources and almost half (48%) of these had sought advice from Tekes before applying. Non-customers’ ratings of Tekes expertise were significantly lower than that of Tekes customers, however, with 58% stating that Tekes expertise had been below their expectations and just 3% stating that Tekes expertise had exceeded their expectations. Only one-third (35%) of non-customers stated that they would definitely consider contacting Tekes for assistance with acquiring international R&D funding in future.

The interviews reveal that while mainstreaming has its potential advantages of bringing internationalisation close to the customers, the international network is now so thinly spread that there is a lack of critical mass, detailed expertise and visibility. The people most closely involved with the EU programmes are now disconnected from the customers as the information has to be filtered through the Tekes experts in the competence areas and the regional ELY centres. That means that the Tekes advisors probably do not have the immediate knowledge of how to tackle specific bottlenecks that experienced EU experts could help solve. In interviews with Tekes experts in the competence areas, it was put forward that they
indeed had little knowledge of the details of EU programmes and interesting calls for proposals. The international peer review panel observed that in an overview of the internationalisation task of Tekes during the peer review board, no mention was given to the EUTI and the NCP work. In fact it was stated that Finland should rethink its focus on the European market as this is in decline and consider how to help companies entering into foreign markets beyond Europe.

7.4 The collaboration with Finpro and the FinNodes

Tekes is increasingly working together with Finpro, an organisation that likes to call itself the Export and Internationalisation Organisation. Finpro is a private organisation owned by the business sector. Members are amongst others the Association of Finnish Industry, the Association of Entrepreneurs and the Association of Technology Firms. Nevertheless, they are almost 50% publicly funded by TEM and, in addition, they receive funding from Tekes to support firms in their international marketing. Typical assignments of Finpro are to help companies develop an export strategy, to look for partners in emerging markets (e.g. China), to do test marketing in new markets. Apart from the paid services they also manage several national projects such as the Cleantech Finland programme. As part of the Future Earning Finland project they help with the global commercialisation of Finnish education. Recently it was decided to merge Invest in Finland into the Finpro organisation.

Finpro has primary trade offices in 50 countries. They have 350 staff altogether of which two-thirds are outside Finland. In Finland they have eight offices (in ELY centres) outside Helsinki that they share with Tekes advisors.

Tekes and Finpro have recently used the same client segmentation although the Tekes clients have to give permission to share their information with Finpro. According to Finpro it is a good move of Tekes to focus on those companies with a growth potential.

Finpro supports the Tekes advisors on the commercialisation and growth capabilities of their client companies. However, Finpro provides services on a fee basis so the companies have to be willing to enter into a contractual relationship with Finpro. They can also receive subsidy from Tekes to work with Finpro.

From the Tekes side it was suggested that the collaboration with Finpro was indeed improving and effective but it also raised some tensions. As Finpro is not the only organisation on the export and foreign marketing coaching market, it was felt that the tight cooperation also sometimes prevents Tekes from advising companies to work with other private consultancies, that might have better expertise in certain export markets or countries. There is mention of a certain ‘crowding out’ effect as a result of the more structural collaboration between the two organisations.
The FinNode network reflects the structural cooperation between Tekes, Finpro, the Foreign Department and TEM. FinNode has offices in India, China, Russia, the US and Japan and Tekes also has staff in these countries. FinNode is more a brand name, not a real legal entity. The FinNode offices mostly provide strategic intelligence that could be of interest to the Finnish companies. The experts focus on foresight activities, describing processes and developments to challenge the Finnish companies to think what these trends mean for them. The FinNode reports cover a wide perspective of trends, not just technological developments but also societal trends and consumer developments. It is difficult to assess the exact value added of the FinNode activities as they provide a more general ‘strategic intelligence’ service rather than a company specific service. We have been told, however, that regular thematic web-seminars to Finnish companies attract quite a few companies. Last year 3000 companies took part in FinNode sessions.

In Enterprise Ireland these kinds of activities are embedded in the organisation which has a large international network that is well appreciated by their customers.

7.5 Results and feedback from Tekes clients

Tekes customers were asked to indicate whether Tekes has provided useful advice on international developments and whether funding support has improved customers’ access to foreign markets. The results are shown in Figure 28 and reveal that only around a third (32%) of customers have received useful information on future international developments from Tekes. However, a much higher proportion of customers (55%) have used the R&D funding provided by Tekes to improve their access to foreign markets. The more innovative firms within our sample were more likely than the less innovative ones to agree that Tekes support has improved their access to foreign markets. So internationalisation through the Tekes core function seems to have the effect of providing access to foreign markets.

Figure 28. Tekes customers’ views on internationalisation support (n=765-792)
Nevertheless, an unsatisfactory level of internationalisation has been a recurrent conclusion in the majority of the evaluations throughout the whole period. As Tekes has in recent years put a specific emphasis on internationalisation in its funding requirements, some improvement appears to have taken place, although it has not disappeared completely from the conclusions of programme evaluations.

7.6 Conclusions

The previous findings and observations lead us to come to the following conclusions:

- Tekes has interpreted its key task regarding internationalisation in terms of helping firms to enter and expand in international markets, thus directly related to the new segmentation of companies and the focus on growth companies with a capability to export. This means that explicit cross-border R&D collaboration has a lower visibility in the Tekes activity portfolio, as it is seen as an indirect means to the key objectives. Finnish companies and researchers can use instruments for cross-border R&D cooperation, including the various EU-funded programmes and collaboration agreements with countries such as the USA, China and Japan. As internationalisation is a cross-cutting goal firstly defined by the Tekes customers, an explicit strategy focusing on certain geographical or thematic areas is not present. The Finnish ministries could usefully consider dedicated R&D collaboration schemes with regions outside Europe in priority fields that fit well with the Finnish national priorities. In addition, defining Finland’s position in Horizon2020 and the emerging Joint Programming initiatives and the role that Tekes can play as an intermediary would also require strategic choices where to focus Finland’s resources.

- The ‘mainstreaming’ of the internationalisation throughout the Tekes organisation with Tekes advisors allocating a small part of their time explicitly to promote international R&D cooperation, means that the dedicated advice on international S&T collaboration has been spread too thinly in the Tekes organisation. Expertise on EU R&D matters is therefore not reaching the customers, in particular the companies, sufficiently well.

- The current FinNode activities of Tekes are relatively low key and provide a 'strategic intelligence function' that seems to interest large group companies through web-seminars. While some outside Tekes have suggested a more active ‘matchmaking’ role of Tekes representatives abroad, in our view the provision of ‘matchmaking’ functions goes beyond the scope of Tekes role.
8 Tekes Internal organisation and organisational efficiency

8.1 Governance

Until 2008 Tekes was an agency of the Ministry of Trade and Industry but is now one of the agencies of the Ministry of Employment and the Economy (TEM), that came into being after a merger of the Ministries for Regional Affairs, Labour and Trade and Industry.

The Finnish State has four important governance roles:

- The Government appoints the Director General of Tekes (at this moment the procedure for the successor of present DG Saarnivaara who is retiring this year is going on).
- The Government (with the Minister of TEM playing a strong role) appoints the Board of Tekes, consisting of 7-9 members.
- The Board includes a representative from the Ministry (by law). Until 2012 the Director General for Innovation was chairman of the Board of Tekes. Early in 2012 the Ministry streamlined the governance of its agencies. Based on contemplations of good governance, it was decided that the chair would have an industrial background, while the vice-chair would need to be a civil servant. Furthermore, the operational responsibility for Tekes in the Ministry was moved from the TEM concern management unit (responsible for all TEM agencies) to the innovation directorate within TEM.
- Budgets for Tekes are determined by Parliament each year. Tasks and performance indicators of Tekes are negotiated with the Ministry every year and laid down in a performance agreement.

In practice, Tekes is quite distant from the Ministry. The Ministry is in this way safeguarding Tekes from day to day-political pressure (and the other way round: Tekes is safeguarding the Minister to some extent from public pressure).

Tekes has indicated it would like to become a government-owned company with a public task (like Finnvera) instead of an agency that is a part of the Ministry but has not been able to explain to us what the advantages of this are. They seem however limited since the strategy of Tekes is focused on spending public money. Changing the legal status will not change the necessity for tight administrative procedures nor reduce the political responsibility of the Minister.

The present governance structure gives Tekes freedom to determine their strategy (with involvement of the Ministry when necessary) but requires formal approval of the strategy and democratic control afterwards. Furthermore Tekes and the Ministry conclude a quite target-orientated performance agreement every year (with the Tekes annual working plans as annex). This performance agreement gives
much management freedom for Tekes on how to reach targets. Tekes and Ministry representatives are satisfied with the way the governance is organised.

Compared to many other agencies, in Finland as well as abroad, Tekes has much freedom to determine their strategy (with democratic control afterwards). In the last few years, governance has tightened to some extent, but Finnish innovation policy is still to a large extent determined by Tekes.

Over its existence the focus of Tekes has gradually shifted from R&D cooperation to technology policy to innovation policy. Accordingly, activities also moved more and more into supporting the private domain. This slow shift is also visible in the governance of Tekes. With the start of SHOKs, programming responsibility within these programmes was completely moved away from Tekes to industry and research organisations in the relevant areas (and in practice to the large industrial companies in the SHOKs). In addition, the TEKES Board was changed in 2012, from the traditional representation of employers, workers, industry (federation) and universities, to a more industry-orientated Board (with representation of a university) and a chair with an industry background (instead of a TEM chair). Finally, the new Tekes DG has an industry background as well.

Although it is far too early to assess the effects of these changes in governance, the balance between strategic research (for long term renewal of Finnish firms and the Finnish firm base) and shorter term R&D addressing more immediate company needs, should be guarded.

\[58\] VTT: Funder, activator, networker, investor: Exploring Roles of Tekes in Fuelling Finnish Innovation, Tekes Review 289/2012
8.2 Organisational structure

In Figure 29 the organisation chart of Tekes is shown.

Figure 29. Tekes organisational structure

The Tekes Board decides on Tekes general policies and broad-reaching issues with fundamental significance such as the initiation of the Tekes programmes. It approves strategic plans and annual work plans before they are submitted to the Ministry. Furthermore, the Board decides on the funding of R&D projects if the funding by Tekes exceeds €3m. The Board considers Tekes to be a professional organisation, that involves them well and is very capable of designing a strategy and preparing proposals for them.

The Director-General is leading the Tekes organisation and is responsible for the strategic development of Tekes as well as for carrying out Tekes tasks. He makes operational decisions on projects with Tekes funding between €1m and €3m.

The Management team of Tekes consists of 7 Executive Directors and the Director General. This is called the Strategic management team.

One of the Executive Directors (Director of administration) is responsible for all administrative and supporting processes of Tekes. This is organised in a line organisation consisting of approximately 80 employees.

All other Executive Directors work in the matrix organisation that Tekes has built to organise various different perspectives in their operations:
• A working processes perspective, organised around four core processes, with each having an Executive Director
• A competence/technology perspective, with an executive director for competence areas
• A business sector perspective, with an executive director for industrial branches

The reason for having this matrix was to improve communication in the organisation and to prevent closed groups within the organisation.

The hierarchical management of the personnel in the matrix organisation (annual appraisal, competence development, career development, etc.) is done under the responsibility of the Executive Director for competence areas. Functional management is done under the responsibility of the other Executive Directors. Everyone in the matrix has one hierarchical boss but may have more than one functional boss depending on the tasks assigned.

Implicitly a fourth dimension (geography) is taken into account as well: 15 people work in Tekes offices outside Finland, 94 are located in 14 regional ELY centres (and are even formal ELY-centre personnel, performing Tekes duties)\(^59\).

Because of the special needs that start-up companies have and the specific skills needed to advise them properly, start-ups are seen as a separate sector. This could also be seen as a fifth dimension in the matrix.

An Operational management team (comprising the Strategic management team excluding the DG and the Executive Director for administration, so it consists of all Executive Directors in the matrix) prepares operational decisions for the Strategic management team. This is done in order to prevent overloading the DG.

The complex organisational structure also appears to have affected the decision-making processes in Tekes. As it was phrased by one of the interviewees: “Tekes has too many people who can say no and too little who say yes”. This has a negative influence on the speed of decision-making but also on the motivation of people (“we have to present the same things to the same people over and over again”). Leadership in this respect appears to be lacking somewhat and this should clearly be improved in the near future.

8.3 Core processes

Tekes is very mission-orientated (Innovation for Finland) and has four ‘core processes’ for its customer service provision:

• **Steering** (strategy): the process of strategy development and implementation. It comprises a holistic approach for management (i.e. there are no separate risk management and quality management systems) that is circular-focused on continuous improving/renewing. There are two cycles: a four-year cycle (aligned with the political election process) for a thorough review of the

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59 Figures on personnel from Tekes annual report 2010.
strategy (involving scenario planning, intensive stakeholder interaction, strategy writing and implementation) and an annual updating process around the performance agreement with the Ministry. The annual cycle interacts with customers and stakeholders and provides reasoned visions of the drivers of R&D and innovation, new opportunities and strategic choices required for success. The whole covers foresight, evaluation, innovation research and support for the preparation of innovation policy and results in an updated rolling 5 year budget plan and a performance agreement for the next year with the Ministry (in Q3 of the year).

- **Customer relationships.** Customers include companies, universities, polytechnics and research institutes, state organisations, (federations of) municipalities as well as other organisations. Tekes encourages companies and research groups to engage in R&D and innovation, networking, growth and internationalisation. Tekes coordinates and communicates its offering (funds?) in cooperation with other TEM-actors and by means of shared customer segmenting in such a way that the whole optimally serves the needs of various customer groups and of Finnish society. Tekes seeks long-term partnerships with customers that aim at internationalisation, growth and network building, in which each customer or customer group is provided with a service package tailored to their specific needs. With customers occasionally engaging in R&D, Tekes provides services to improve the customer’s know-how, networks and ability to take on even more challenging R&D in the future. In order to encourage new companies to become involved in innovation activities, Tekes cooperates with networks of operators close to companies and, as needed, initiates various activation projects.

- **Programmes.** Tekes programmes typically have three phases. After an embryonic phase, where an initial decision to start programme preparation is taken, a planning phase of 6-18 months follows in which the programme is developed in cooperation with external experts and stakeholders. The final decision to start a programme is taken by the Board. The execution phase of the programme is 3-6 years (2-3 years for SME programmes). Tekes programme managers implement programmes. They may be supported by external programme coordinators.

    The SHOK members, who in cooperation develop a portfolio of programmes and projects, plan the SHOK programmes. These programmes and projects are individually approved by the Tekes Board but, after that, managed by the SHOK management and executed by the SHOK partners.

- **Funding.** Applications for funding are (since last year) submitted electronically. For each application the sector director appoints an economic analyser and a technical analyser. These analyse the application and present their analysis to the sector director. The sector director can make a decision if the funding asked is under €350,000. For projects between €350,000 and €1m the funding
process director will decide. If between €1-3m then the general director will decide. Decisions over €3m are a Board decision. The time needed to evaluate proposals at present is 70 days (median), the target is 75 days. For simple proposals faster evaluation routes are developed. About 2 out of 3 proposals submitted are approved.

Apart from grants, Tekes also provides loans (some 30% of the total funding for companies). These are considered to be state aid only for their subsidy interest part and for the part which in the case of failed projects is converted into a grant. Due to a high funding percentage the loans provide additional financial liquidity to the customers. Loans are typically granted for 5–10 years. In practice some 20–30% of loans are not paid back.

After approval each project is designated a Tekes expert to assist with the project and to monitor its progress.

8.4 Support functions

All support functions are outside the matrix. In this line-organisation there are 7 units including ICT, HRM, finance and budgeting, security and premises.

In cooperation with the programme officers from the matrix, the financial department handles the customer requests for payments. The programme officers look at technical aspects (does the project perform as planned?) and the funding officer in the finance departments looks at funding aspects (EU requirements, Tekes regulation, etc.). When a payment is approved, the financial unit pays the grant. Tekes is paying directly from the state treasury financial account.

It was reported that due to the annual budgeting cycles of the Finnish ministries Tekes receives its funding on an annual basis as well. This has led to situations that programmes that are well received by the stakeholder community, already run out of funding in October. Tekes needs to delay good proposals that come in after that time until January of the following year when new funding is received.

Tekes does not administer the repayment of loans. The State Treasury department does this.

The ICT department is organising Tekes ICT processes. All application procedures are now electronic and Tekes has a paperless office, which means that the working processes can be parallel (several people at the same time). This will in the near future help in reducing the time of processes.

Tekes processes are strongly driven by strategy. The strategy is annually translated in individual work plans, with ‘target cards’ for each employee based on Tekes strategy, unit targets and individual targets. Targets relate to the dimensions of the matrix and are more on output and impact than on input. Officers themselves can decide when they do what.
Long term HRM policy is also strategy-based and concerns:

- **Leadership**: The target is to have strategy-based leadership, which inspires, motivates and encourages people. There has been a leadership programme, which lasted two years, including workshops and 360 degree evaluations. This is monitored by way of a personnel survey.

- **Competence management**: The target is to secure the ability to renew the organisations through defined strategic competences, continuous competence development process and a competence development framework.

- **Rewarding**: is seen as very broad and includes financial and non-financial rewarding methods. It is based on challenging work-tasks, good development opportunities (including training, flexible time opportunities, mobile work opportunities, occupational health care, recreational facilities, etc.) and a remuneration system (performance based salary system, employee of the year, team of the year). 50% of salary is based on difficulty of the work, 50% is based on individual performance. Annually managers evaluate the performance of each employee by pre-set criteria (efficiency, results, competence, attitude: all on a scale of 1-5).

- **Organisational culture**: People must feel secure and have good challenges and opportunities. Good internal communication is important. Furthermore, Tekes strives to have a culture of continuous improvement (effectiveness and efficiency).

- **Wellbeing**: There is systematic attention on improving the working environment and strengthening team spirit.

Only 30% of present personnel have civil servant status (the highest positions and those who make funding decisions), the rest are on permanent contract (working agreements). Job security for civil servants is higher but civil servants and other personnel have the same salary system.

The average age of Tekes personnel is 45/46. On average people work 7-8 years for Tekes.

At present, Tekes has a strong focus on recruiting people from the business side, in order to acquire more business skills. This is successful and there is much demand for jobs at Tekes. Currently, 42% of personnel have an economics or society educational background, 38% have a technical background. Everybody at Tekes receives business training.

Tekes does survey employee satisfaction. The response rate is over 80%. Results are very good, better than those of other organisations (this is a multi-company evaluation).

From exit interviews it becomes clear that people leaving Tekes mainly go to private companies, some to sister organisations.

All Tekes processes are driven by or connected to the Tekes strategy and there is much focus on continuous learning, by measurement and feedback.
In order to implement the new strategy within Tekes a change programme is developed with six major projects: Customer experience; Enterprise funding; Public research funding; Programme activities; Communications and Future Tekes (new office facilities - flex office, novel approaches to expert-work: distant working, internet communities, work/life balance, in 2013). The fundamentals will be the same after the change programme: it is just sharpening the focus within the present organisation.

8.5 Efficiency

Efficiency can be considered at policy level as well as at organisational level. The efficiency of Tekes as a policy instrument is defined as the impact of Tekes divided by the total budget for Tekes. As this cannot be assessed in quantitative terms, this will be discussed in the chapter on effectiveness (5). This chapter focuses on organisational efficiency: what costs are made for the processes of Tekes and what can be improved? Furthermore, there is also a focus on some governance and management organisation issues.

8.5.1 Operating costs

Tekes states that their costs for the core funding process (assessing of projects) are 2.3% of the budget. They have decreased over the past few years because budgets increased and costs remained stable. The total costs of the Tekes organisation are, however, much higher (8% in 2010, coming down from 10.5% in 2008). These costs include management costs, internal meetings, customer contacts, analysis, tasks for the Ministry, etc.

It is difficult to compare these figures with comparable figures from other organisations: tasks are different and administrative registration of tasks is also different. We have, however, tried to compare Tekes with a number of benchmark organisations in other countries (Figure 30).

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60 Figures provided by Tekes, Matti Hiltunen, 14-2-2012
Figure 30. Comparison of Tekes with benchmark agencies

<table>
<thead>
<tr>
<th></th>
<th>Tekes (Finland)</th>
<th>NL Agency*</th>
<th>The Enterprise Ireland</th>
<th>Vinnova (Sweden)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP in country in 2011 (billions of PPS)</td>
<td>€157.2</td>
<td>€551.8</td>
<td>€234.4</td>
<td>€299.5</td>
</tr>
<tr>
<td>Agency’s budget (2010)</td>
<td>Tekes invested €633m in projects. (This does not include cost of programme delivery).</td>
<td>NL Agency’s income from its clients amounted to €280.8m. (Budget includes cost of programme delivery).</td>
<td>EI’s income amounted to €454.7m. (Budget includes cost of programme delivery).</td>
<td>Vinnova invested €220m in projects. (This does not include the cost of programme delivery).</td>
</tr>
<tr>
<td>Staff number in 2010 (FTE)</td>
<td>~295</td>
<td>2293</td>
<td>~900</td>
<td>190</td>
</tr>
<tr>
<td>Indications of efficiency (2010)</td>
<td>Operating cost: €33m**. This equals ~€112,000/FTE</td>
<td>Overhead cost: ~15% (i.e. ~€42m). This equals ~€18,400/FTE</td>
<td>Administration, operation and promotion cost: €94m (i.e. <del>20% of total expenditure). (</del>€104,400/FTE)</td>
<td>Operating cost per FTE: ~€167,275 / FTE ***) (overheads therefore ~15%)</td>
</tr>
</tbody>
</table>

* Note that NL Agency’s remit is much broader than the remit of the other agencies. For example, it includes not only innovation but also topics such as energy and climate change, environment and the Patent Office. The number of staff mentioned relates to all activities, so is an over-estimation.

** These exclude the operating costs of the Innovations and International Business Operations at the Centres for Economic Development, Transport and the Environment (Tekes Annual Report 2010, p. 7). Overheads are estimated at 8% (Matti Hiltunen)

*** The Annual Report 2010 of Vinnova reports operating cost per FTE: SEK 1,474,000, which equals €167,275.

Tekes budget as part of Finnish GDP is significantly higher than that of the other agencies. Tekes costs as a share of their budget are, however, significantly lower than any of the agencies.

The programme level findings from many programme evaluations show cost ranges from 2% to 25%***, depending on the type of programme (in decreasing order of costs: loan/grant/fiscal facility); the number of projects (some economies of scale); the average size of projects (in general: the larger the project, the lower the relative costs for programme management); the complexity of the evaluation process and the programme activities included in the costs (programme marketing, networking activities, programme publications etc.). In general, grant programmes with only limited networking activities but including programme communication have a programme overhead of 5% to 7%.

The 2.3% costs for the core funding process as reported by Tekes excludes programme communications and all other programme activities but can certainly not be called high. A fairly standardised process for all applications within Tekes, with a fair amount of proposals of on average fairly large sized, internal evaluations

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61 Estimate by Technopolis based on numerous evaluations
of project applications (i.e. by Tekes officers), electronic application procedures and paperless ICT support systems are probably underlying causes for the low costs.

In addition, efficiency seems enhanced by the fact that Tekes has a strong ‘brand name’ and a target group that is limited in size. In this way communication can be kept rather focused and communication costs can be low.

8.5.2 Options for increasing organisational efficiency

Our interviews with Tekes personnel suggest that, although some efficiency gains may be realised in the funding process, the main opportunities for increasing efficiency lie outside the funding core process.

First of all, the complex structure of the Tekes organisation (more specifically the matrix structure) seems suboptimal. Once introduced to improve internal communications and prevent ‘silos’ in the organisation\(^\text{62}\), it seems to have fulfilled its goal and is increasingly considered a burden by Tekes personnel. It not only takes time but also diminishes outside focus and personal energy. In a three dimensional matrix (that in practice for a significant part of Tekes staff is four or even five dimensional), units become too small to be efficient and the complexity hampers effective communication. Simplifying the matrix (to two dimensions, for example, by merging the competence and sector dimensions of the matrix, or by replacing both with a client segmentation dimension with larger units) could reduce the time needed for internal meetings and even invigorate more effective communication. Tekes has indicated this will be done by the new director general.\(^\text{63}\)

Secondly, there appears to be an option for improving efficiency in the management of ‘other tasks’ that Tekes is performing for TEM and other Ministries. Based on our interviews, we have the impression that quite a lot of Tekes staff are involved in these other tasks such as being on management committees (national and international), advisory committees, organisational boards and sounding boards, etc. They spend a great deal of time on this, even though these tasks are not on their personal target cards and are not (or only to a limited extent) discussed in their annual appraisals. In this way Tekes is very customer friendly (here the Finnish public organisation is defined as customer) but there appears to be no overview on what is being done and priority setting for these activities is based on personal interest/bargaining power and not on strategy (neither from Tekes nor from the Ministry/ies side). While this observation certainly does not mean that we would suggest that Tekes should not do these tasks anymore, it does mean that these tasks should be prioritised and managed at a higher level than at present.

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\(^{62}\) Interview Mr. Saarnivaara, 3 April 2012

\(^{63}\) The most natural time for restructuring decisions would have been at the end of last year: Tekes had renewed its strategy and organisational structure is one of the main tools for implementing strategic changes. The director general of Tekes however made a conscious decision not to change the structure because he was about to retire during 2012. In this way the next director general can make the changes he wants.
8.6 Image of Tekes

Finally Tekes does not have the unassailable position in the public debate anymore, like it used to have. Tekes always had a very positive image and was considered a strong 'brand'. Tekes is considered arrogant by some and not as open and cooperative as it used to be. Tekes interventions are questioned in political and public debates and even a rally against Tekes has been organised. The very defensive, almost cramped reaction of Tekes to criticism over the past years has weakened the image of Tekes. In order to reverse this negative atmosphere, Tekes must refocus its communications and be more proactive, not reactive. This does not only mean communication of efforts and effects but an intensive open participation in the public discussion. Tekes must (again) be leading the public debate, as a facilitator giving a broad platform to contributions from all parts of society, including high quality contributions from their own organisation.  

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64 Tekes is assessing its communication strategy as one of the pillars in its Change Programme
9 Conclusions and recommendations

9.1 Main conclusions

1. Overall it can be concluded that Tekes has performed well and is indeed a leading innovation agency in the world. The road from giving a grant or a loan to a commercially successful innovation is however long and often very indirect. Tekes efforts and the economic performance of Finland can therefore not directly be linked. At best, Tekes can create some of the conditions necessary for success. However with its activities Tekes has contributed to increasing research intensity, increasing cooperation between companies and knowledge infrastructure which for Finland are important areas and in this way has helped build knowledge and competences for the international competitiveness of Finnish companies.

2. The world is however changing rapidly and constantly. International challenges (at some points aggravated by national circumstances) require more attention for the renewal of a firm base, with a focus on companies able to excel in international markets. Tekes has taken these developments into account in its new strategy, aiming at the renewal of sectors and at supporting the start-up and high growth companies operating in international markets. The new strategy seems to encompass a sensible shift in portfolio, without a complete break with the past but poses risks that the recipes developed will not work as well as interventions in the past.

4. The new strategy is rather young but Tekes was already (before it was fully formulated) operating along the main lines of the strategy. Therefore the changes in the strategy are already very visible in Tekes operations: SHOKs were introduced as a support instrument for the renewal of existing sectors, Tekes budgets going to large companies was heavily reduced while funding for start-ups and growth companies increased strongly, with new funding rules and mechanisms.

5. With respect to Tekes instruments and activities, the following can be concluded:
Tekes individual support for larger companies seems, although it is heavily criticised, a good way to connect research organisations and smaller companies to sector leaders and in this way give them connection to international markets. In a broader sense, the Finnish system as a whole is seen as not producing enough breakthrough innovations and commercial results. Traditional R&D grants are insufficient to make commercial success. Tekes has, among other things, created new funding and service schemes for potential high growth
companies and renewed its funding allocations and funding criteria in favour of these companies. Tekes has also created a new funding scheme for public research organisations with the special focus on spinning off new high growth companies from research organisations. There are concerns that Tekes is lacking the skills and procedures to optimally support the start and growth of a business enterprise but Tekes is perceived as recently offering more of the right incentives to stimulate commercial success.

A large part of Tekes budget is now distributed through SHOKs and while it is in theory a good idea to let industry decide on the best way to renew their business/sector, in practice the danger of a lack of joint vision, too short a time horizon and crowding out new challengers in the sector is large. Furthermore the IPR regulations may be too open for companies to bring in their really good ideas. But SHOKs have not been evaluated in detail (this is done in an ongoing evaluation) and have just started. In our opinion SHOKs are not the wrong direction in which to go.

The Tekes programme approach that was recently developed in addition to the SHOKs, with two different types of programmes: research-orientated programmes for the strategic renewal of the Finnish knowledge base and need-driven programmes meeting the strategic development needs of SMEs, seems suitable to pick up and organise new developments and cater for the needs of innovative SMEs. This approach (especially the focus on SMEs) must however still prove itself as must the interaction with the SHOKs.

Tekes has a leading role in services innovation policy development in Europe and services innovation has picked up significantly in Finland. Tekes has also played a large role in supporting workplace development in Finland. Both policies have proved their capabilities for boosting innovation.

The role of Tekes in public sector innovation has had successes and failures. Successes (e.g. the reduction of energy consumption in the building sector) are obtained when Tekes focuses its efforts (consistent support for R&D, promoting interaction between regulators, forerunners, users and demand-side measures like experiments, the creation of lead markets and procurement) on supporting industry to create solutions for solving government problems with clear solution routes. When the solution route is not yet clear, Tekes interventions have been less successful (e.g. in the healthcare sector).

6. The Finnish Innovation support system is rather complex, with many players. After the merger of Invest in Finland with Finpro, the division of tasks at the national level is, for insiders, clear. The complexity of the system however makes it unclear for outsiders where to go to for their support needs.

7. Tekes has interfaces with many organisations in the system. On these interfaces there is (often good) operational cooperation but there seem to be good opportunities for strategic and operational synergies that are presently not
exploited. Many clients seem to understand the different roles of the different organisations in the system.

8. At regional level the Tekes network is organised in the ELY centres. Tekes has representations in all centres (except Helsinki). This regional network is very important for the regions, it gives them a direct connection to national innovation funding and provides expertise to the regions that would otherwise be difficult to get. It also connects Tekes to companies in the regions. However not all Tekes areas of expertise are available directly in all ELY centres, because the representations are sometimes rather small, so often outside expertise has to be used. This may be inefficient (or when outside expertise is not used) even ineffective.

9. Tekes has interpreted its key task regarding internationalisation in terms of helping firms to enter and expand in international markets, thus directly related to the new segmentation of companies and the focus on growth companies with a capability to export. This means that explicit cross-border R&D collaboration has a lower priority in the Tekes activity portfolio, as it is seen as an indirect means to the key objectives. It seems that Tekes priority and resources for international R&D collaboration are at a low level today. There are only very limited dedicated cross-border R&D collaboration programmes or initiatives run by Tekes. The Finnish Distinguished Professor Programme (FiDiPro) is the main programme, which is run together with the Academy of Finland. At this moment there seems to be a limited strategic approach in which domains and geographical areas’ dedicated effort for international S&T collaboration should be developed.

10. The ‘mainstreaming’ of the internationalisation throughout the Tekes organisation, with Tekes advisors allocating a small part of their time to explicitly promote international R&D cooperation, means that the dedicated advice on international S&T collaboration has been spread too thinly in the organisation. A small coordination unit of four people that have to filter EU expertise throughout the Tekes organisation as well as the wider Finnish NCP-network cannot really make a difference. Expertise on EU-R&D matters is therefore not reaching the customers, in particular the companies.

11. The current FinNode activities of Tekes are relatively low key and provide a ‘strategic intelligence function’ that seems to interest large group companies through web-seminars. While there has been discussion of a more active ‘matchmaking’ role of Tekes representatives abroad, this is a very difficult service to get right – many countries have tried this type of service with varying success - and would need a considerably larger investment of people and resources.

12. Tekes has operated efficiently. Its operation costs are 8% of its policy budget. Although the sets of activities are difficult to compare, this is certainly not high in comparison with agencies abroad. 2.3% of these 8% costs are related
to direct programme management and funding activities. The rest is spent on 
‘other tasks’.

13. Tekes also performs well overall with regard to the quality of its processes and 
personnel and is in general terms a very well regarded agency, by its customers, 
employees and by its colleagues abroad. In the last few years however, Tekes 
does not have the unassailable position in the public debate that it used to have. 
Tekes is considered arrogant by some, and not as open and cooperative as it 
used to be. Tekes interventions are questioned in political and public debates. 
The very defensive, almost cramped reaction of Tekes to criticism over the past 
years has weakened its image of Tekes.

14. Tekes is strongly mission-orientated. All Tekes processes are driven by 
or connected to the Tekes strategy and there is much attention focused on 
continuous learning, by measurement and feedback.

15. The present governance structure gives Tekes freedom to determine their 
strategy but requires formal approval of the strategy by TEM. Furthermore 
a quite target-orientated performance agreement is concluded between TEM 
and Tekes every year based on Tekes annual working plans. Compared to 
many other agencies, in Finland as well as abroad, Tekes has much freedom 
of operation. In the last few years, governance has tightened to some extent 
but the implementation of Finnish innovation policy is still to a large extent 
determined by Tekes. Tekes and TEM representatives are satisfied with the 
way the governance is organised.

16. The Tekes Board is the highest authority within the Tekes structure. The 
Board considers Tekes to be a professional organisation that involves them 
well and is very capable of designing a strategy and preparing proposals for 
them. Following a generic TEM regulation on Agency Boards, the Tekes Board 
was changed in 2012 to a more industry-orientated Board and a chair with an 
industry background (instead of a TEM chair).

17. The organisational structure of the Tekes organisation (more specifically 
the ‘Matrix structure’) is too complex. Once introduced to improve internal 
communications it has fulfilled its goal and is increasingly considered a burden 
by Tekes personnel.

9.2 Recommendations for TEM

1. Tekes has performed well (conclusion 1); the strategy of Tekes seems sensible 
(conclusion 2) and is rapidly being implemented (conclusion 3) and those 
involved in the governance of Tekes (Ministry, Board and Tekes themselves) are 
satisfied with the governance of Tekes (conclusions 14 and 15). Tekes should 
therefore remain the innovation agency for the Finnish government and 
major changes to Tekes governance are not necessary (‘don’t fix what is not 
broken’).
2. This also means that the legal structure of Tekes can remain the same. Changing the legal status will not change the necessity for tight administrative procedures nor reduce the political responsibility of the Minister and has therefore no large advantages over the present structure.

3. Tekes should also not merge with other organisations. These mergers might distort the system of checks and balances between the organisations and their (different) missions (e.g. Tekes/Academy) and might in some cases even lead to conflicting goals within one organisation (e.g. Tekes/Finnvera). Mergers would also even further focus the attention on internal processes at the agencies, instead of focusing on serving customers.

4. Over its existence the focus of Tekes has gradually shifted from R&D co-operation to technology policy to innovation policy and its activities moved more and more into supporting the private domain. In the governance of Tekes this became recently visible. SHOKs have their own programming responsibility and Tekes became more industry-orientated with a chair from industry and the new Tekes DG has an industry background as well. Although it is far too early to assess the effects of these changes in governance, the balance between strategic research (for the long term renewal of Finnish firms and the Finnish firm base) and shorter term R&D addressing more immediate company needs, should be guarded.

5. The Finnish Innovation support system is very complex for outsiders. TEM, as owner or principal of most of the relevant players, should implement (in cooperation with all the agencies) within its agency system (including the ELY centres) a cooperation structure consisting of a clear division of tasks, a comprehensive customer segmentation, good mutual knowledge of each others’ support instruments and an effective way of signposting to each other.

6. TEM should also support more strategic cooperation between its agencies, by providing the right incentives and support structure. Regular meetings of the Director Generals of all relevant TEM agencies especially aiming at strategic and operational synergies could be held.

9.3 Recommendations for Tekes

1. Tekes has performed well (conclusion 1), the strategy of Tekes seems sensible (conclusion 2) and is rapidly being implemented (conclusion 3). Tekes has a high quality of processes and personnel (conclusion 12) and is a strategy-driven learning organisation (conclusion 13). This also means that Tekes should not change completely but should start improving from the present, well working operation.

2. With respect to Tekes instruments and activities (conclusion 4), the following recommendations are made:
- **Tekes individual support for larger companies** seems valuable from a network perspective and **should** therefore **not be abolished**.

- **In the core funding process, the speed of appraisal and selection processes needs to be increased** (2 months should be possible), the administrative burden of application processes needs to be reduced and feedback on unsuccessful applications needs to be improved. This is of special importance for start-up and fast-growing companies (that often need money fast) and other SMEs.\(^65\)

- **The connection of Tekes advice to the business practice of their customers** (esp. the start-ups and fast growing companies) **needs to be further improved to optimally support the start and growth of a business enterprise**.

- **The balance between SHOK funding and Tekes (new style) programme funding must be constantly monitored and set out against the need for renewal in sectors (SHOKs) and renewal of sectors (Tekes programmes), taking into account results that are achieved**.

- **Services development and workplace development** have proven their capacity for boosting innovation but **should be translated from their specific programmes to the whole of Tekes operations**. Tekes has started this already in services innovation. The introduction of the methodologies from these areas may offer opportunities for broader implementation of demand-driven innovation.

- **In public sector innovation processes, Tekes must always take account of supporting private companies to create (business) solutions, contributing to public sector innovation**. Tekes must not participate in public sector innovation processes where there is no role for private companies or where the solution route for the public problem is not yet clear. Tekes has recently chosen this direction and should keep on working this way.

3. **Access to the complex Finnish Innovation support system is difficult** (conclusion 5) and should be improved. Tekes should contribute to the cooperation structure between agencies (consisting of a clear division of tasks, a comprehensive customer segmentation, good mutual knowledge of each others’ support instruments and an effective way of signposting to each other - recommendation 5 to TEM).

4. **Tekes should**, in response to conclusion 6, **realise more strategic and operational cooperation with other national Finnish agencies**:
   - With the Academy, discussions should be started on joint research programmes and other strategic ways of operating, especially in the area of international science cooperation.

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\(^{65}\) Tekes has indicated that the recommended actions are tackled by the change programme that is set up to implement the new strategy.
For support to start-ups the cooperation between Tekes, Finnish Industry Investment and the Finnvera VC funds should be more formalised and more ambitious in its support role.

With Finnvera, more information on customers should be exchanged and analysed in more detail to provide better support. Operational synergies should be explored and captured in skills and in systems.

Tekes should explore cooperation models with FinPro to make the FinPro knowledge accessible for their customers. The (partly) commercial operations of Finpro may however be a problem that must be solved first.

With Sitra, communication could be better structured at a strategic level, which may result in more strategic cooperation, especially when approaches for addressing broader societal issues are developed.

5. In response to conclusion 7, the optimal configuration of Tekes regional representation requires separate study but we expect that reducing the number of regional representations from five to seven will be a good way to advise companies in the regions in more effective and efficient ways. In this study the role of cooperation with Finnvera and Finpro regional offices (which are at present out-side the ELY centres) should also be considered. Cooperation with the ELY centres that have no Tekes representation anymore should also be looked at, so that they keep their function as an antenna for Tekes to detect regional companies for their target group and keep connected to the national support system.

6. The focus on new growth markets and helping companies to enter into trade opportunities is seen as more in line with the key mission (conclusion 8). Tekes and the Finnish ministries could consider dedicated R&D-collaboration schemes with regions outside Europe in priority fields that fit well with the Finnish national priorities.

7. It seems that Tekes priority and resources for international R&D collaboration is at a low level today (conclusion 9). The focus on new growth markets and helping companies to enter into trade opportunities is seen as more in line with the key mission. If this is a deliberate choice of the Tekes organisation, then this should be explicitly discussed with the Finnish stakeholders in the context of a rethinking of Finland’s role in the future Horizon2020. If Tekes is considered as the key organisation that provides the links with EU research policy, then it should reconsider how it organises that role within the Tekes organisation in a manner that has more critical mass and dedicated expertise in the various domains that are important to Finland.

8. The current FinNode activities of Tekes are relatively low key (conclusion 10). In our view the provision of ‘matchmaking’ functions goes beyond the scope of Tekes key role as a funder of research and innovation.

9. Tekes has operated efficiently (conclusion 11). Although some further efficiency gains may be realised in the funding process, the main opportunities for
Increasing efficiency lie outside the funding core process. Especially other tasks that Tekes is performing for the Ministry (or other Ministries than TEM) should be prioritised and managed better than at present.

10. Tekes image has weakened (conclusion 14). In order to improve this, Tekes communication must be proactive and open. Tekes must (again) be leading the public debate, as a facilitator giving a broad platform to contributions from all parts of society, including high quality contributions from their own organisation.

11. The organisational structure of Tekes (more specifically the ‘Matrix structure’) is too complex (conclusion 16). The three dimensional matrix should be simplified to a two dimensional one. This will cut down the time needed for internal meetings and invigorate effective communication.

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66 Tekes has indicated that the recommended actions are tackled by the change programme that is set up to implement the new strategy.

67 Tekes has indicated this structural change will be implemented by the new director general.
Evaluation approach

For this evaluation various methods for data collection were used:

- Desk research
- A survey to Tekes customers and non-customers
- An organisational assessment of Tekes based on self-assessments and interviews with Tekes employees
- Interviews with stakeholders outside of Tekes from policy, intermediaries, research and business
- An international comparison of the innovation support networks in three countries including an assessment of the Finnish R&D internationalisation strategies
- Four focus groups with experts, including an international focus group

The evaluation was supported by a Sounding Board that was assembled by the Ministry of Employment and the Economy.

A.1 Desk Research

Desk research included an analysis of relevant reports and strategy papers, a portfolio analysis of Tekes instruments and a composition analysis of the customer base of Tekes (in relation to other TEM-organisations).

For the composition analysis of the customer base, data was gathered by Tekes into one database and then analysed by the evaluation team.

Due to Finnish bank secrecy rules we were unable to conduct the analysis of overlap between Finnvera and Tekes customers internally. Representatives of Finnvera however agreed to conduct the analysis themselves and we arranged a safe transfer of Tekes customer data to them. The results presented are based on outputs provided by Finnvera. They relate to the profiles of customers of both organisations during the five-year period from 2007 to 2011 and involve customer profiles by size, organisation type and sector.

A.2 Survey with Tekes customers

Two questionnaire surveys were designed and administered as part of the study. The first was directed to all Tekes customers in the past 5 years and the second was directed to a sample of organisations that had applied to Tekes for funding support within the past 2 years but without success and who had not received any Tekes funding in the past five years.

In addition to the regular Tekes customer satisfaction surveys, this survey took a broader look at the role of Tekes and the provision of services and support in Finland.

An attempt was made to align the survey with the evaluation of Finnvera which was done at the same time as the evaluation of Tekes and use the Finnvera customers...
as control group for the Tekes customers. However, because Finnvera was not able to provide e-mail addresses from their customer base because of legal issues, this could not be done.

In Appendix B the design of the surveys, their implementation and the response rates obtained are described. The surveys were designed by Technopolis and translated into Finnish by VTT.

A.3 Organisation and management assessment
As a base for assessing the Tekes organisation and management, the Tekes management provided a self-evaluation addressing the following issues:

- The most important achievement of Tekes in the past 5 years
- The effectiveness and efficiency of Tekes and need/opportunity to improve
- The gaps in Tekes portfolio, in terms of specific target groups, types of services/support, spatial coverage
- The efficiency of the present innovation support system in Finland and possible changes
- The main strengths and weaknesses of Tekes, as seen from the customer perspective
- The foreseen (anticipated?) major changes in the Tekes organisation in the next five years

Furthermore, interviews were conducted with 27 representatives from the Tekes organisation (Figure 31). All interviews except one were conducted face to face.

Figure 31. Interviewees from the Tekes organisation

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timo Kekkonen</td>
<td>Vice-chair Tekes Board until 2012, Director Federation of Finnish Industries</td>
</tr>
<tr>
<td>Petri Peltonen</td>
<td>Chair of Tekes Board until 2012, Director General for Innovation, Ministry of Employment and the Economy</td>
</tr>
<tr>
<td>Aino Sallinen</td>
<td>Board member Tekes until 2012, Rector University of Jyvaskylä</td>
</tr>
<tr>
<td>Veli-Pekka Saarnivaara</td>
<td>CEO</td>
</tr>
<tr>
<td>Mika Aalto</td>
<td>Director Forest and Chemical Industries</td>
</tr>
<tr>
<td>Martti Äijälä</td>
<td>Executive director Industrial Branches and Regional Network</td>
</tr>
<tr>
<td>Tuomo Alasoini</td>
<td>Director workplace innovation and development</td>
</tr>
<tr>
<td>Ari Gööroos</td>
<td>Executive director funding</td>
</tr>
<tr>
<td>Riikka Heikinheimo</td>
<td>Executive director Competence areas and International Network</td>
</tr>
<tr>
<td>Antti Heiskanen</td>
<td>Head regional operations</td>
</tr>
<tr>
<td>Minna Hendolin</td>
<td>Director Life Science Industries</td>
</tr>
<tr>
<td>Ulla Hiekkanen- Makela</td>
<td>Head of customer relationships</td>
</tr>
<tr>
<td>Matti Hiltunen</td>
<td>Director strategic planning</td>
</tr>
<tr>
<td>Hannu Kemppainen</td>
<td>Executive director strategy</td>
</tr>
<tr>
<td>Jussi Kivistoki</td>
<td>Head of programmes core process</td>
</tr>
</tbody>
</table>
A.4 Interviews with stakeholders

As part of the evaluation we conducted 37 interviews with Tekes stakeholders (Figure 32). 29 interviews were face-to-face, 7 by telephone and 1 was performed by e-mail.

**Figure 32. Tekes evaluation stakeholder interviews**

<table>
<thead>
<tr>
<th>Type</th>
<th>Organisation</th>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>agency</td>
<td>Finpro</td>
<td>Kari Häyrinen/Karesto</td>
<td>President, CEO/ordinator Finnode</td>
</tr>
<tr>
<td>agency</td>
<td>Academy of Finland</td>
<td>Markku Mattila/Riitta Mustonen</td>
<td>President/Vice President for Research</td>
</tr>
<tr>
<td>agency</td>
<td>Finnish Industry Investment Ltd</td>
<td>Juha Marjosola/Henri Grundstén</td>
<td>President &amp; CEO/ Director</td>
</tr>
<tr>
<td>agency</td>
<td>ELY-Centre North Karelia</td>
<td>Ritva Saarelainen</td>
<td>Director</td>
</tr>
<tr>
<td>agency</td>
<td>ELY-Centre Kouvola</td>
<td>Tuula Saynatmaki</td>
<td>Head of Unit</td>
</tr>
<tr>
<td>agency</td>
<td>Sitra</td>
<td>Juha Kostiainen</td>
<td>Director</td>
</tr>
<tr>
<td>agency</td>
<td>Vigo Programme</td>
<td>Seppo Ruotsalainen</td>
<td>Vigo Programme Coordinator</td>
</tr>
<tr>
<td>agency</td>
<td>Finnvera</td>
<td>Pauli Heikkilä/Annamarja Paloheimo</td>
<td>Managing Director/ Senior Vice President</td>
</tr>
<tr>
<td>government</td>
<td>TEM</td>
<td>Jouni Hakala</td>
<td>State Secretary</td>
</tr>
<tr>
<td>government</td>
<td>Ministry of Education and Culture</td>
<td>Anita Lehikoinen</td>
<td>Director</td>
</tr>
<tr>
<td>government</td>
<td>Ministry of Finance</td>
<td>Tuomas Sukselainen</td>
<td>Budget department</td>
</tr>
<tr>
<td>industry association</td>
<td>Federation of Finnish Technology Industries</td>
<td>Juha Ylä-Jääski/ Jorma Turunen</td>
<td>Director, Innovation Environment/CEO</td>
</tr>
<tr>
<td>industry association</td>
<td>Pharma Industry Finland</td>
<td>Mia Bengtsröm</td>
<td>Senior Adviser</td>
</tr>
<tr>
<td>industry association</td>
<td>Chemical Industry Federation of Finland</td>
<td>Timo Leppä</td>
<td>MD</td>
</tr>
<tr>
<td>industry association</td>
<td>PALTA (services sector)</td>
<td>Riitta Varpe</td>
<td>CEO</td>
</tr>
<tr>
<td>industry association</td>
<td>Foundation of Finnish Inventions/Boardman Oy</td>
<td>Pekka Roine</td>
<td></td>
</tr>
</tbody>
</table>
Key topics for the interviews were:

- The achievements of Tekes in the past 5-10 years
- The governance and management of Tekes
- The match of Tekes activities with the national innovation strategy and government policies in the area of economic and regional development, research and innovation and other domain policies such as wellbeing, health, sustainability and international relations
- The dialogue and interaction of Tekes with its customer base and with other stakeholders
- The Tekes response to internationalisation and global market developments
- Foreseen challenges to the Finnish economy and society and the response of innovation policy to that (e.g. ‘grand challenges’)
- The role, responsibilities and boundaries of Tekes in the Finnish innovation system, also in relation to other actors now and in the future.
A.5 International comparison and R&D internationalisation

In order to gain insight into how other countries organise the delivery of their innovation policies and services to various target groups and how Finland compares to these countries, we compared the Finnish situation (not only Tekes with an innovation agency in another country but with the set of organisations reflecting organisations in the TEM-concern) to the situation in European countries of a similar size to Finland: Sweden (Vinnova), The Netherlands (Agency NL) and Ireland (Enterprise Ireland).

Issues addressed were:

• **The national policy mix**
  - What are the main national R&D and innovation (RDI) policy objectives?
  - What are (if any) prioritised technology areas / sectors / themes / societal challenges? Is it a coherent set of priorities?
  - What are (if any) priority target group(s) or sectors? E.g. fast-growing, internationalising SMEs?
  - What (type of) policy measures are in place? Recent developments in the RDI policy mix?

• **The policy delivery system**
  - What is the division of labour in the national policy delivery system for implementing the R&D and innovation (RDI) policy mix? What is the role of the selected innovation agency (i.e. NL Agency, Enterprise Ireland, …?) Is there just one agency, or are other agencies present to e.g. deliver support for basic research, support for entrepreneurship, etc.
  - How and by whom are the national RDI policy objectives implemented with a mix of programmes and schemes and other tasks?
  - What is (if relevant) the regional dimension in the policy delivery system: to what extent is the policy delivery system decentralised to regional organisations?
  - How are internationalisation objectives incorporated in the policy delivery system? E.g. with a separate agency, or as an integral part of a larger innovation agency?

• **Efficiency of the organisation**
  - How efficient is the agency in delivering its services? What share of the programme budgets is used for managing/implementing the programme?
  - If possible, at multiple levels of aggregation (the level of individual policy measures, the level of divisions and the level of the whole organisation)

• **The service delivery system**
  - How does the selected innovation agency deliver its services to its customers?
  - How is the organisation set up to deliver its services and how does it deal with its customers? For instance, is there an account management system?
A.6 Focus groups with stakeholders and experts

Finally four focus groups were organised to explore future challenges, opportunities and needs of stakeholder groups. Topics and participants are given in Figure 33.

Figure 33. Focus group participants

<table>
<thead>
<tr>
<th>International, 2 March 2012</th>
<th>Demand and user driven innovation, 3 and 4 April 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Brandkamp</td>
<td>Reijo Kangas</td>
</tr>
<tr>
<td>Hans de Groene</td>
<td>Timo Kekkonen</td>
</tr>
<tr>
<td>Martin Lyes</td>
<td>Matti Rae</td>
</tr>
<tr>
<td>Marc Stanley</td>
<td>Pilvi Takala</td>
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<tr>
<td></td>
<td>Matti Sommarberg</td>
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<tr>
<td></td>
<td>Cargotec Oy</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Michael Brandkamp (Germany)</td>
<td></td>
</tr>
<tr>
<td>Hans de Groene The Netherlands Organisation for Scientific Research</td>
<td></td>
</tr>
<tr>
<td>Martin Lyes Enterprise Ireland</td>
<td></td>
</tr>
<tr>
<td>Marc Stanley National Institute of Standards and Technology (USA)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Services innovation, 2 April 2012</th>
<th>Start-ups and growth companies, 3 April 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaj Hedvall</td>
<td>Jussi Hattula</td>
</tr>
<tr>
<td>Juha Huikkonen</td>
<td>Ulla Hiekkanen-Mäkelä</td>
</tr>
<tr>
<td>Tuula Jäppinen</td>
<td>Kari Herlevi</td>
</tr>
<tr>
<td>Pasi Julkunen</td>
<td>Jukka Rauhala</td>
</tr>
<tr>
<td>Laura Kauppinen</td>
<td>Pekka Simula</td>
</tr>
<tr>
<td>Juha Kostiainen</td>
<td>Oncos Therapeutics Oy</td>
</tr>
<tr>
<td>Jari Kuusisto</td>
<td>SC Research</td>
</tr>
<tr>
<td>Kimmo Pentikäinen</td>
<td>Elisa Oy</td>
</tr>
<tr>
<td>Kari Pentilä</td>
<td>f-secure Oy</td>
</tr>
<tr>
<td>Anssi Rantasalo</td>
<td>Kempi Oy</td>
</tr>
<tr>
<td>Minna Suutari</td>
<td>Tekes</td>
</tr>
</tbody>
</table>

Technopolis
Appendix B

Survey approach and method

Two questionnaire surveys were designed and administered as part of the study. The first was directed to Tekes customers and the second was directed to a sample of organisations that had applied to Tekes for funding support within the past 2 years but without success and who had not received any Tekes funding in the past five years.

Below we describe the design of the surveys, their implementation and the response rates obtained. The surveys were designed by Technopolis and translated into Finnish by VTT.

B.1 Survey of Tekes customers

B.1.1 Design of the questionnaire
The design of the questionnaire was guided by the main evaluation questions. The members of the evaluation team produced a draft version of the questionnaire and provided space for members of the steering group and representatives of Tekes to comment. All comments were incorporated into the survey design. The surveys included questions about the organisation that the respondent was representing, its awareness of the services provided by Tekes, the relevance and importance of those services, success in obtaining support from Tekes, feedback on Tekes procedures and its role within the Finnish support system and, finally, recommendations for strengthening Tekes role and operations.

B.1.2 Development of contact lists of Tekes customers
Tekes provided the study team with a list of its customers covering 5,139 organisations. For each organisation, there were several managerial contacts for the projects that Tekes had supported. As such, for many organisations there was more than one contact in the database. We decided not to contact multiple people within the same organisation and so we selected those assigned to the most recent project. In a small number of cases the same contact (i.e. e-mail address) was listed for more than one organisation. Therefore, of the 5,139 organisations in Tekes customer database we were able to seek feedback from 5,076 of them.

B.1.3 Administration of the surveys
The survey was administered through a professional online survey tool. The survey was launched on 12th of March 2012 and the message asking for feedback was sent to all 5,076 organisations for which we had contact information. In 120 cases the e-mail was not successfully delivered or the recipient had previously ‘opted out’ of participating in surveys, leaving 4,956 successfully delivered survey requests.
The survey remained open for a limited time period of just two weeks, with a deadline of the 26th of March. A reminder message was sent to all non-respondents four days prior to closure of the survey.

**B.1.4 Response rates and profile of responding organisations**

Despite the short period during which the survey was open, 1,029 (partial or full) responses were received, representing a response rate of 21%.

We compared the profiles of the survey respondents to the profile of Tekes customers by size and sector and found the sample provided a good representation of the whole population of supporting organisations based on these two measures. Figure 34 and Figure 35 compare the profiles of Tekes customers with respondents to the customer survey.

**Figure 34. Comparison of profile of Tekes customers to those who were successfully mailed and those who responded to the main Tekes survey, by size**

<table>
<thead>
<tr>
<th>Size category</th>
<th>Number and share of customers</th>
<th>Number and share of successfully mailed</th>
<th>Number and share of survey respondents</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro (&lt;10)</td>
<td>2,543 (48%)</td>
<td>2,261 (48%)</td>
<td>477 (50%)</td>
<td>21%</td>
</tr>
<tr>
<td>Small (10–49)</td>
<td>1,517 (28%)</td>
<td>1,338 (28%)</td>
<td>270 (28%)</td>
<td>20%</td>
</tr>
<tr>
<td>Medium-sized (50–249)</td>
<td>472 (9%)</td>
<td>416 (9%)</td>
<td>61 (6%)</td>
<td>15%</td>
</tr>
<tr>
<td>Large (250-1999)</td>
<td>624 (12%)</td>
<td>531 (11%)</td>
<td>110 (11%)</td>
<td>21%</td>
</tr>
<tr>
<td>Large 2000 (2000+)</td>
<td>189 (4%)</td>
<td>171 (4%)</td>
<td>45 (5%)</td>
<td>26%</td>
</tr>
<tr>
<td>Total</td>
<td>5,345</td>
<td>4,956</td>
<td>1,029</td>
<td>21%</td>
</tr>
</tbody>
</table>


**Figure 35. Comparison of profile of Tekes customers to those who were successfully mailed and those who responded to the main Tekes survey by sector**

<table>
<thead>
<tr>
<th>Branch</th>
<th>Number and share of customers</th>
<th>Number and share successfully mailed</th>
<th>Number and share of survey respondents</th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>50 (0.9%)</td>
<td>45 (0.9%)</td>
<td>2 (0.2%)</td>
<td>4%</td>
</tr>
<tr>
<td>Mining and quarrying</td>
<td>29 (0.5%)</td>
<td>24 (0.5%)</td>
<td>4 (0.4%)</td>
<td>17%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1,437 (26.4%)</td>
<td>1,266 (26.4%)</td>
<td>279 (28.4%)</td>
<td>22%</td>
</tr>
<tr>
<td>Electricity, gas, steam and air conditioning supply</td>
<td>28 (0.5%)</td>
<td>25 (0.5%)</td>
<td>6 (0.6%)</td>
<td>24%</td>
</tr>
<tr>
<td>Water supply; sewage, waste management and remediation activities</td>
<td>39 (0.7%)</td>
<td>36 (0.8%)</td>
<td>9 (0.9%)</td>
<td>25%</td>
</tr>
<tr>
<td>Construction</td>
<td>216 (4.0%)</td>
<td>183 (3.8%)</td>
<td>35 (3.6%)</td>
<td>19%</td>
</tr>
<tr>
<td>Industry</td>
<td>2012</td>
<td>2011</td>
<td>2010</td>
<td>Change</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>--------</td>
</tr>
<tr>
<td>Wholesale and retail trade; repair of motor vehicles and motorcycles</td>
<td>426 (7.8%)</td>
<td>384 (8.0%)</td>
<td>76 (7.7%)</td>
<td>20%</td>
</tr>
<tr>
<td>Transportation and storage</td>
<td>65 (1.2%)</td>
<td>53 (1.1%)</td>
<td>13 (1.3%)</td>
<td>25%</td>
</tr>
<tr>
<td>Accommodation and food service activities</td>
<td>31 (0.6%)</td>
<td>27 (0.6%)</td>
<td>4 (0.4%)</td>
<td>15%</td>
</tr>
<tr>
<td>Information and communication</td>
<td>1,176 (21.6%)</td>
<td>1,071 (22.4%)</td>
<td>222 (22.6%)</td>
<td>21%</td>
</tr>
<tr>
<td>Financial and insurance activities</td>
<td>62 (1.1%)</td>
<td>58 (1.2%)</td>
<td>14 (1.4%)</td>
<td>24%</td>
</tr>
<tr>
<td>Real estate activities</td>
<td>51 (0.9%)</td>
<td>47 (1.0%)</td>
<td>12 (1.2%)</td>
<td>26%</td>
</tr>
<tr>
<td>Professional, scientific and technical activities</td>
<td>1,074 (19.7%)</td>
<td>953 (19.9%)</td>
<td>195 (19.8%)</td>
<td>20%</td>
</tr>
<tr>
<td>Admin and support service activities</td>
<td>114 (2.1%)</td>
<td>99 (2.1%)</td>
<td>17 (1.7%)</td>
<td>17%</td>
</tr>
<tr>
<td>Public administration and defence; compulsory social security</td>
<td>64 (1.2%)</td>
<td>60 (1.3%)</td>
<td>11 (1.1%)</td>
<td>18%</td>
</tr>
<tr>
<td>Education</td>
<td>94 (1.7%)</td>
<td>88 (1.8%)</td>
<td>20 (2.0%)</td>
<td>23%</td>
</tr>
<tr>
<td>Human health and social work activities</td>
<td>174 (3.2%)</td>
<td>159 (3.3%)</td>
<td>29 (3.0%)</td>
<td>18%</td>
</tr>
<tr>
<td>Arts, entertainment and recreation</td>
<td>50 (0.9%)</td>
<td>42 (0.9%)</td>
<td>9 (0.9%)</td>
<td>21%</td>
</tr>
<tr>
<td>Other service activities</td>
<td>72 (1.3%)</td>
<td>62 (1.3%)</td>
<td>15 (1.5%)</td>
<td>24%</td>
</tr>
<tr>
<td>Activities of extraterritorial organisations and bodies</td>
<td>1 (0.0%)</td>
<td>1 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0%</td>
</tr>
<tr>
<td>Industry unknown</td>
<td>198 (3.6%)</td>
<td>105 (2.2%)</td>
<td>11 (1.1%)</td>
<td>10%</td>
</tr>
<tr>
<td>Total</td>
<td>5,451</td>
<td>4,956</td>
<td>1,029</td>
<td>21%</td>
</tr>
</tbody>
</table>


B.1.5 Analysis and reporting

In addition to a descriptive analysis of survey results we used non-parametric tests to judge whether the differences in answers provided by various groups of respondents were statistically significant.

The data of ordinal nature from questions (for example questions about awareness and relevance of Tekes support) were analysed by the Mann-Whitney U test, which is a non-parametric alternative to the independent samples t-test. This statistical method does not require the assumption of normality or the assumption of homogeneity of variance as it compares medians rather than means of the sample and is therefore more suitable for this type of data.

Results from all questions in the above-mentioned sections of the questionnaire were also subjected to further analysis by use of the Chi-square test for association which was particularly useful as it points at group level differences by comparing expected and actual frequency counts for each possible answer. The Chi-square test is a widely accepted statistical test for assessing two groups that yield two independent samples of nominal data (for example yes/no/maybe questions).
Both of the tests were run at a significance level of 5% and in cases where both of these tests were run, they showed nearly identical results which confirms the robustness of the findings.

**B.2 Survey of non-customers (unsuccessful applicants)**

*B.2.1 Design of the questionnaire*
In designing the questionnaire to be directed to organisations that had applied for but had not received support in the recent past, we selected all questions from the main customer survey that were applicable to non-customers. Some questions were amended to fit the purpose and to collect maximum comparable information.

*B.2.2 Development of contact list of unsuccessful applicants*
We were provided with a list of 484 unsuccessful applicants. For 30 of these we were not provided with an e-mail address and were therefore unable to include them in the survey. The remaining contacts were de-duplicated resulting in 447 unique contacts with e-mail addresses that could be used for the mail-out. In 11 cases our messages were returned as undeliverable or related to individuals who had previously opted out of receiving surveys, meaning that our requests were successfully delivered to 436 potential respondents.

*B.2.3 Administration of the surveys*
The survey remained open for the same period as the first survey, giving respondents just two weeks to reply.

*B.2.4 Response rates and profile of responding organisations*
We received 84 responses, which represented 19% of the approached unsuccessful Tekes applicants. It is not possible to compare this sample to the population, as the necessary information for this analysis is not available.

*B.2.5 Analysis and reporting*
Once the deadline had passed the survey data was analysed and written up in parallel with the main customer survey data. Where appropriate, the responses provided by the two groups (customers and unsuccessful applicants) were compared using the statistical tests described in Section B.1.5.
Appendix C

Summary of the International Panel Review for the Tekes Evaluation

C.1 Introduction of the International Panel
A one-day panel meeting with high level experts in managing and steering innovation and research agencies took place in Helsinki on 2 March 2012.
Panel members were:
Michael Brandkamp: High-Tech Gründerfonds (Germany)
Hans de Groene: The Netherlands Organisation for Scientific Research
Martin Lyes: Enterprise Ireland
Marc Stanley: National Institute of Standards and Technology (USA)

The panel members were briefed beforehand with key information on Tekes, a summary of its core strategy and a discussion note on three topics that came out of the evaluation team’s work that would benefit from an external view. In addition the panel was briefed on the expectations and key issues from the viewpoint of TEM by Petri Peltonen. In addition a delegation from Tekes gave a presentation to the panel and had an open discussion with the panel members.

In order to use the time wisely, the panel were asked to prioritise three topics that are elaborated on below. The panel discussed the issues and came up with some examples of how this is done in other countries.

C.2 Topic 1: Tekes strategy to focus on high-growth firms as a target group

C.2.1 The context provided
Tekes has in recent years adapted its current strategy to these external challenges and criticisms. It has prioritised growth-seeking and innovative SMEs as its key target group. It will increase the focus on forerunners and strategic innovations. While the focus was previously on industries and technologies, the organisation will focus more on services and non-technological innovations. One third of project funding will be allocated to young SMEs. More projects will be high-risk type of projects.

The panel members discussed the advantages and disadvantages of such an approach, the need to adapt the Agency for this strategy and the position it would need to take in relation to other organisations in the Finnish innovation system.

C.2.2 The panel discussion
The panel members discussed the skills that are needed for the change in customer approach that Tekes has chosen.
On the one hand it was argued that this needs a close review of the skill sets that Tekes has in-house compared to the skill set that is needed for the new approach. Tekes reported on the training in commercial and business skills that their mostly technical staff have received. In addition, new recruits have a mostly commercial background rather than a technical one.

On the other hand it was also argued that Tekes does not necessarily need all these skills in-house; it could also use external expertise when appropriate. The question was raised whether a public agency needs a complete range of technological, managerial, business sector and financial in-house staff?. Some made a stronger plea for having a small entrepreneurial type of organisation which contracts specific knowledge when needed.

The new segmentation of customer groups – growth SMEs, domestically operating SMEs and large companies – was presented to the panel by Tekes. It was confirmed by Tekes that this segmentation is a joint strategy by all support agencies in the TEM-network. This is the basis on which to agree which TEM organisation takes which company. Tekes has expressed in this TEM network that it wants ownership of the new fast growth companies, the growth companies in general and the international innovative SMEs. The panel commented that that sounded like a government-driven rather than a customer-driven segmentation.

It was questioned by the panel as to how far the new segmentation is realistic, given the fact that such a large share of the Tekes funding goes to the universities and research institutes. The Tekes response was that this is mostly applied research that is also co-funding companies. However the panel did not receive a convincing answer on the question of how this impact on the companies is measured. In addition, understanding how R&D funding is used to augment export is not easily measured so this would put Tekes in a difficult position to demonstrate added value. Particularly as the largest segment of customer group, the domestically-orientated local companies according to the Tekes slides, still receive the largest share of the funding.

A discussion arose that customer relationships involve more than having a good Customer Relations Management (CRM) system, they are also about being responsive to changing client needs. On the question of how long it takes Tekes to launch a new programme, the response was that a big programme would cost approximately six months to prepare and another 6 months to launch. Small 'activation' type initiatives (e.g. Helsinki Design Capital) can be done in six weeks. The customer responsiveness appeared to be harmed mostly by annual budget cycles, that make that popular programmes already run out of money by October and then have to wait till the next year to be replenished again. On the question from the panel if Tekes would rather be a non-public sector organisation to run its business, the response was that a status as a publicly owned corporation similar to Finnvera would probably make Tekes more flexible and less dependent on annual budgets. The panel also had strong doubts about the fact that Tekes is given new tasks by the ministries that fall outside
their core business, such as innovation in the public health sector. It was judged to spread Tekes tasks out too broadly.

One panel member described Tekes as ‘stuck in the middle’ between an organisation that provides grants and an organisation that provides value added services to companies. If it wants to be the second then it would need to have a more independent position from the government and change the type of people who are working at Tekes. Others also suggested that the added value service provider role needs a careful consideration as to why the state would be willing to intervene. It also needs a systemic approach: who should do what in the system. It was stressed that Tekes should not try to do everything. In the example of the German High-Tech Gründerfonds the mentoring role for start-up companies is taken up by a network of independent coaches. It was generally stressed that the added value services of such organisations have a business-led approach.

C.3 Topic 2: A new role to support start-up companies

C.3.1 The context
The strategy to focus more on high-risk projects and young start-up companies raises the question of what could be Tekes role in relation to other organisations in the Finnish support system that support young firms? Tekes provides both grants and loans to companies. Increasingly Tekes looks at the whole business (and their business model) to decide whether funding should be given, rather than at a discreet technology project. This means that different expertise is needed alongside the technological expertise that most Tekes account managers have today.

This would also involve close collaboration with other organisations supporting high growth start-ups such as Finnvera (and its venture capital initiative Seed Fund Vera Ltd), regional incubator initiatives and so on. Previous studies and the international peer review of Finland however show that the system is getting too fragmented and complicated from the perspective of the companies.

C.3.2 The panel discussion
The discussion centred around the question of what role Tekes should play in the wider innovation system and whether they know how to provide services specifically for the high-tech start-ups. Part of the discussion is already described in the segmentation discussion above.

The panel stressed that young high-tech companies need more support than receiving funding. Experience shows that they need management coaching and general entrepreneurial support. It was questioned whether Tekes and its staff were capable of providing that type of support as it is so different to the traditional R&D funding advice. Tekes responded that in the Vigo-accelerator and Young Innovative Companies programme, the Tekes R&D funding expertise was combined with expertise from entrepreneurs (a Tekes advisory team that works part-time for Tekes)
for the mentoring role. Tekes itself would not engage in equity financing so a seed- and venture capital role is not in question. It was also discussed that identifying the needs of high-tech start-ups should be a role for the technology transfer offices (TTOs) of the universities and the various science and technology parks. In Tekes view unfortunately these are often not of sufficiently high quality, so Tekes has seen a need to step in at these TTOs to take over that role. The potential for new start-ups at the universities remains an unknown entity that, according to the panel, should receive more attention but not necessarily from Tekes. As already stated above, Tekes should not try to do everything themselves but also hire independent experts.

A major issue that the panel members raised was the limited interaction of Tekes with the Academy of Finland and the Ministry for Education on the issue of university start-ups but also on the issue of medium to long-term strategic research based on public-private collaboration. The role of the SHOKs to provide these structural linkages was raised as a topic but as this is outside the scope of the panel discussion, it was not dealt with at length. The example of the Dutch Research Council was given where recently half the Council’s funding has been allocated to a limited number of Top Priority Sectors. Considering the mobilisation of high-tech start-ups from academic research, it was seen that the universities should be held responsible.

C.4 Topic 3: Internationalisation

C.4.1 The context
Internationalisation is a key element of Tekes strategy, in line with the main national science and technology policy objectives. Tekes no longer has a separate ‘internationalisation unit’ or internationalisation programmes but has chosen to ‘mainstream’ the internationalisation objective throughout the delivery of its services. Thus every unit in Tekes is responsible for internationalisation. The prioritisation of companies with an ambition to export is considered as the most important ingredient of the internationalisation strategy.

In the last couple of years the international Tekes network has been downsized considerably. Today Tekes has foreign offices in China (Beijing and Shanghai), Brussels, the United States (Silicon Valley and Washington) and Japan (Tokyo). These offices provide strategic intelligence and a ‘foresight’ type of information from these countries, rather than direct services to Finnish companies wanting to do business in these markets. Both in Finland (regional customer centres) and in the six foreign offices, Tekes works together with FinPro, a public-private organisation (strongly rooted in the business sector) that provides coaching and support for Finnish companies that wish to export. The FinnPro services are provided on a fee basis. Tekes and FinnPro have aligned their customer segmentation and share leads in some of the regional centres but not across Finland. Tekes and Finpro have organised teleconference sessions with Finnish companies in various regional centres which
focused on providing information on particular markets in specific countries (e.g. the ICT market in India).

A number of Finnish support organisations have created the FinNode as a brand for the customer to recognise the support network. There is a debate that the international element of the support system should be streamlined better. A first step has been announced that Invest in Finland will be merged with FinnPro. The question is if further integration is needed.

Tekes has a network of people that are part of the National Contact Point system but mostly these people work on a part-time basis, providing information on EU-programmes. It coordinates the EU R&I programmes’ Unit that also includes the NCPs in other Agencies (Academy Finland and some ministries). It was suggested that overall knowledge of EU-funding is not well developed across the regional network of Tekes account managers. Finnish funding is considered much easier to get, so the incentives for taking part in European collaborations are not that high. Overall Finland is doing reasonably well in FP7 although in line with the rest of Europe, industry interest is declining and Nokia already decided years ago not to be active in the FPs.

C.4.2 The panel discussion
The panel were not convinced of the added value of the Tekes people in the FinNode offices and the balance between costs and benefits to having staff in these foreign locations. It was suggested whether these roles could not as easily be played by the FinPro people in those foreign offices or by dedicated staff in the Finnish Embassies.

A closer integration between the ‘Invest-In’ activities and the more outgoing ‘intelligence seeking’ activities was considered as an important step forwards. The example of the merger between the Dutch Export Promotion Agency, the Inward Investment Agency and the network of Science and Technology Attachés into one organisation that deals with international trade and S&T linkages was given as an example where synergies can be found in applying a joint approach.

It was also stated that the attention to the EU-Framework service provision could be approved. The panel was surprised this function was not at all mentioned in the presentation on the internationalisation strategy of Tekes. In addition the highly developed mainstreaming of the EU-FP function throughout the Tekes organisation was considered to be sub-optimal, as it therefore lacked a strong central team with networks and insight in Brussels.

C.5 Conclusions and recommendations
Overall the panel found that the role and position of Tekes in the Finnish innovation system needs to be defined more clearly. Tekes has reorganised and refocused its role in the Finnish economy with a new segmentation of customers. In this process it has needed to overcome boundaries, e.g. in the skills set of its staff but also crossed boundaries of other actors in the Finnish system. Today the unique selling point of
the Tekes organisation needs to be defined more clearly. For instance the question of whether Tekes is an R&D funding agency or a business service provider needs to answered more clearly.

Given the current challenges in Finland, the panel believes that the core work of Tekes should be to support start-up companies and innovative SMEs. If Tekes and its ‘owner’ organisations do decide that this is the best way forward, Tekes needs to re-assess what skills it needs internally and what skills can be provided either by other parts of the TEM-network or by external experts. Also its regional presence then needs to be reconsidered.

It was obvious to the panel members that there are still quite a number of legacies in the Finnish innovation (support) system that cause overlap and fragmentation but also gaps (e.g. lack of professional technology transfer in the university system). Thus the government would need to review the whole system. However, changing a whole system will take too much time. A first step is defining clear roles and a division of labour between all actors in the system, also those outside the TEM-network (e.g. universities, SITRA and the Academy of Finland). If some actors cannot take up their role in the short term (e.g. university TTOs to mobilise start-ups) then Tekes could be asked to step in.

The panel members considered close collaboration between Tekes and the Academy of Finland as essential to secure that medium to long term strategic research in aligned priority themes is well developed and can form the basis of the emerging sectors of the future. This should have a strong steer from both the Ministries of Employment and the Economy and the Ministry of Education and Science.

The panel recommended that it should be explored whether the added value of the Tekes involvement in FinNode could be enhanced. A suggestion was done to see whether the FinPro support could be added to the Tekes support package free of charge. The indirect funding of FinPro activities through Tekes subsidies was considered as sub-optimal.

The panel recommended that if Finland seriously wants to improve its participation in the European Framework Programmes and other international R&D co-operations, it should strengthen its central FP-support unit and have more full-time staff on this activity.

In addition to programme funding that is completely open in time and requires a proposal selection by Tekes staff on a continuous annual basis, the panel recommends the introduction of some open competition-type funding programmes where proposals are assessed by external and independent committees on the basis of high quality criteria. Particularly in new emerging areas where Tekes does not have the in-house expertise, this could complement the current operation model used at Tekes.

Tekes Board of Governors should also reflect the shift in their customer base better and also include representatives from young innovative companies.
Tämä raportti sisältää Tekesin arviointin. Raportin kuvailee Tekesin rationaliteettia ja sen roolia Suomen innovaatiojärjestelmässä sekä arvioi Tekesin vaikutuutta. Tekes on edistänyt toimillaan tutkimusintensiteetin kasvua, lisännyt yritysten ja osaamisinfrastruktuurin välistä yhteistyötä Suomelle tärkeillä alueilla, sekä näin auttanut luomaan osaamista ja kyvykkysä Suomessa sijaitsevien yritysten kansainvälisen kilpailukyvyn parantamiseksi.

Globaali toimintaympäristö muuttuu kuitenkin nopeasti ja jatkuvasti. Tekes on ottanut nämä kehitysnäkymät huomioon uudessa strategiassaan tavoitteenaan uudistaa sektoreita sekä tukea kansainvälisesti toimivia start-up yrityksiä ja nopean kasvun yrityksiä. Uusi strategia näyttäisi kattavan perustellun siirtymän portfoliossa riskin lisäämisen suuntaan mutta tekemättä liiallista kuluua menneeseen.

Tärkeitä parannuskohteita Tekesin toiminnassa ovat sen tuki kansainvälistymiselle, sen suhteet muihin kansallisiin laitoksiin (ml. alueellinen edustaminen) sekä Tekesin rooli julkisessa keskustelussa.

Työ- ja elinkeinoministeriön yhdyshenkilö: Elinkeino- ja innovaatio-osasto/Päivi Marttila, puh. 050 3960062
Denna rapport innehåller en utvärdering av Tekes. Rapporten beskriver Tekes rationalitet och dess roll i Finlands innovationssystem samt utvärderar Tekes effektivitet. Enligt sammandraget av rapporten har Tekes prestationsförmåga varit god och centralen hör till de ledande innovationsfrämjande inrättningarna i världen. Tekes har genom sin verksamhet bidragit till att öka forskningsintensiteten, ökat samarbetet mellan företag och kunskapsinfrastrukturer på områden som är viktiga för Finland och därigenom hjälp till att skapa kompetens och förmågor för att förbättra den internationella konkurrenskraften för företag som är etablerade i Finland.

Den globala omvärlden förändras dock snabbt och ständigt. Tekes har tagit dessa utvecklingsutsikter i beaktande i sin nya strategi med syftet att förnya sektorer samt stödja internationellt verksamma uppstartsföretag och snabbväxande företag. Den nya strategin tycks omfatta en motiverad förskjutning i portföljen i riktning mot ökad risktagning men utan att göra en alltför stor klyfta i förhållande till det förgångna.

Viktiga förbättringsobjekt i Tekes verksamhet är dess stöd för internationalisering, dess relationer med andra nationella inrättningar (inkl. regional representation) samt Tekes roll i den offentliga debatten.

Kontaktperson vid arbets- och näringsministeriet: Närings- och innovationsavdelningen/Päivi Marttila, tfn +358 50 3960062
Evaluation of Tekes – Final Report

In this report the evaluation of Tekes is presented.

The report describes the rationale for Tekes and the role of Tekes in the Finish systems and evaluates its impacts. It is concluded that Tekes has performed well and is among the world’s leading innovation agencies. With its activities Tekes has contributed to increasing research intensity, increased cooperation between companies and knowledge infrastructure in for Finland important areas and in this way helped build knowledge and competences to increase the international competitiveness of Finnish enterprise.

The world is however changing rapidly and constantly. Tekes has taken these developments into account in its new strategy, aiming at renewal of sectors and at supporting start-up and high growth companies operating internationally. The new strategy seems to encompass a sensible shift in portfolio, taking in more risk but without making a complete break with the past.

Important points for improvement are Tekes’ support for internationalisation, its relation with other agencies in Finland (including regional representation) and the role of Tekes in public debate.