EUROPEAN UNION

Committee of the Regions

National and Regional Research in Finland

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RESEARCH PROGRAMMES IN FINLAND

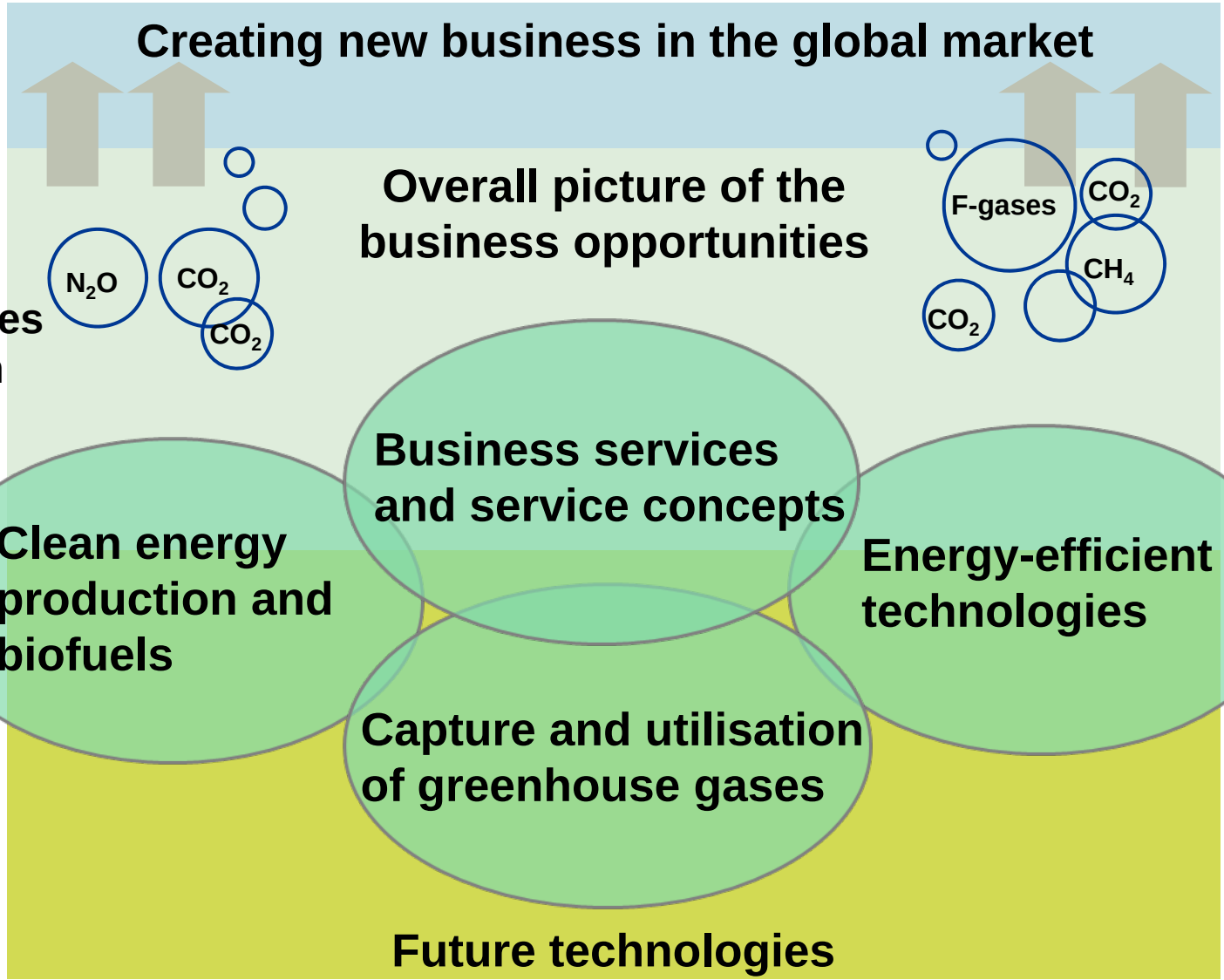
Tekes: National Funding Agency for Technology and Innovation

- ClimBus - Business Opportunities in Mitigating Climate Change
  - Programme duration: 2004-2008
  - Programme volume: 70 million euros, approximately 50 % Tekes funding
- Biorefine – New Products from Biomass
  - Programme duration: 2007-2012
  - Programme volume: 137 million euros, approximately 50 % Tekes funding
- FINE – Fine Particles: Technology, Environment and Health (www.tekes.fi/fine)
  - Programme duration: 2002-2005
  - Joint funding by Tekes, Ministry of Transport, Ministry of Environment, Academy of Finland, total volume 26 M€

Academy of Finland

- SUSEN Sustainable Energy 2008-2011
  - Academy contribution 9 M€ + Fortum, Neste Oil, UPM, Nessling Foundation

Focus areas of ClimBus programme



130 companies participate in ClimBus

Tekes' programmes

Programmes of other financers

http://www.tekes.fi/climbus

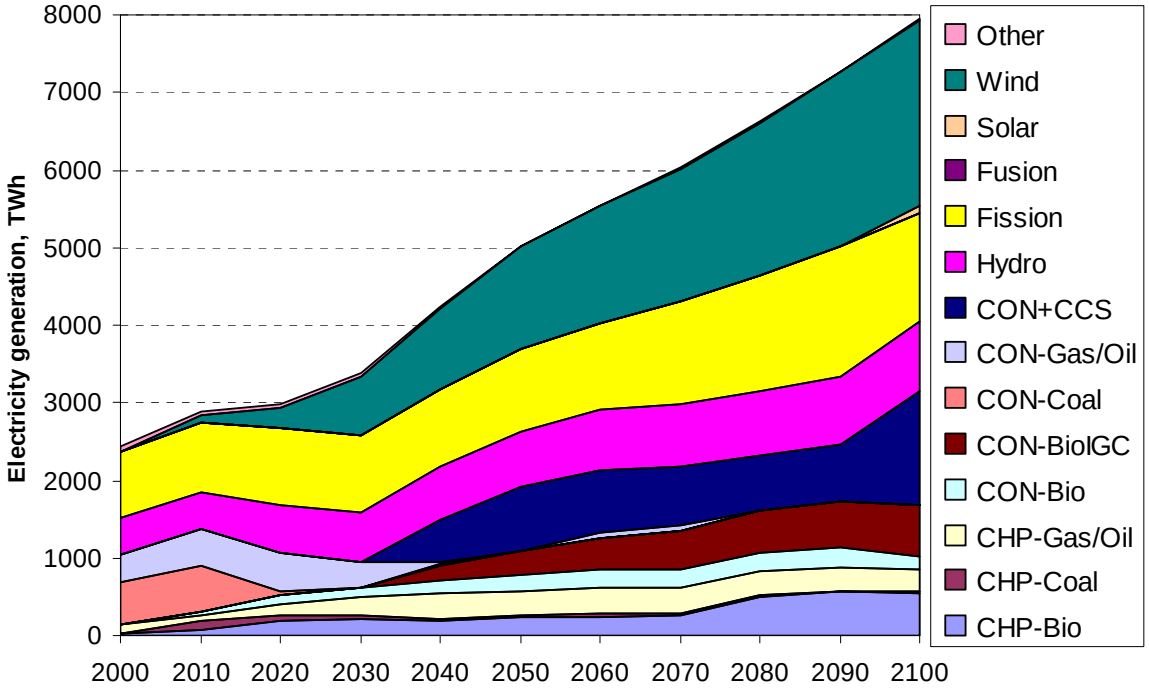
Example of Climbus projects at VTT: Cost-efficient emission reduction strategies of ambitious mitigation policies

- Funding: Tekes, VTT, MTT, BOFIT, Fortum, Fingrid, Gasum, Ministry of Foreign Affairs, Federation of Technology Industries, ÅF Enprima.

Specifications:

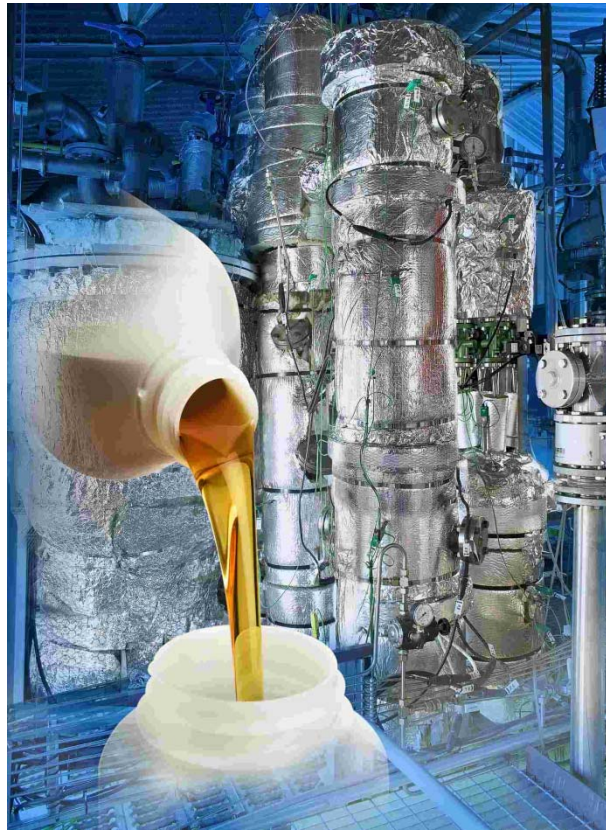
- 2 ºC target set for 2100
- Additional target -30% from 2000 by 2030 and -50% until 2050 for Annex I countries
- Emissions trading can take place within Annex I countries until 2050
- After 2050, perfect global emissions trading is assumed

- Achievement of the 2 ºC target would imply a dramatic change of the whole energy system towards low-emission energy sources and technologies.



Electricity production in Western Europe in cost-efficient GHG emission reduction for achieving 2 C target. Source: VTT TIAM calculations. Syri et al.2008. *Int.J. GHGC.*

Projects on Biorefining



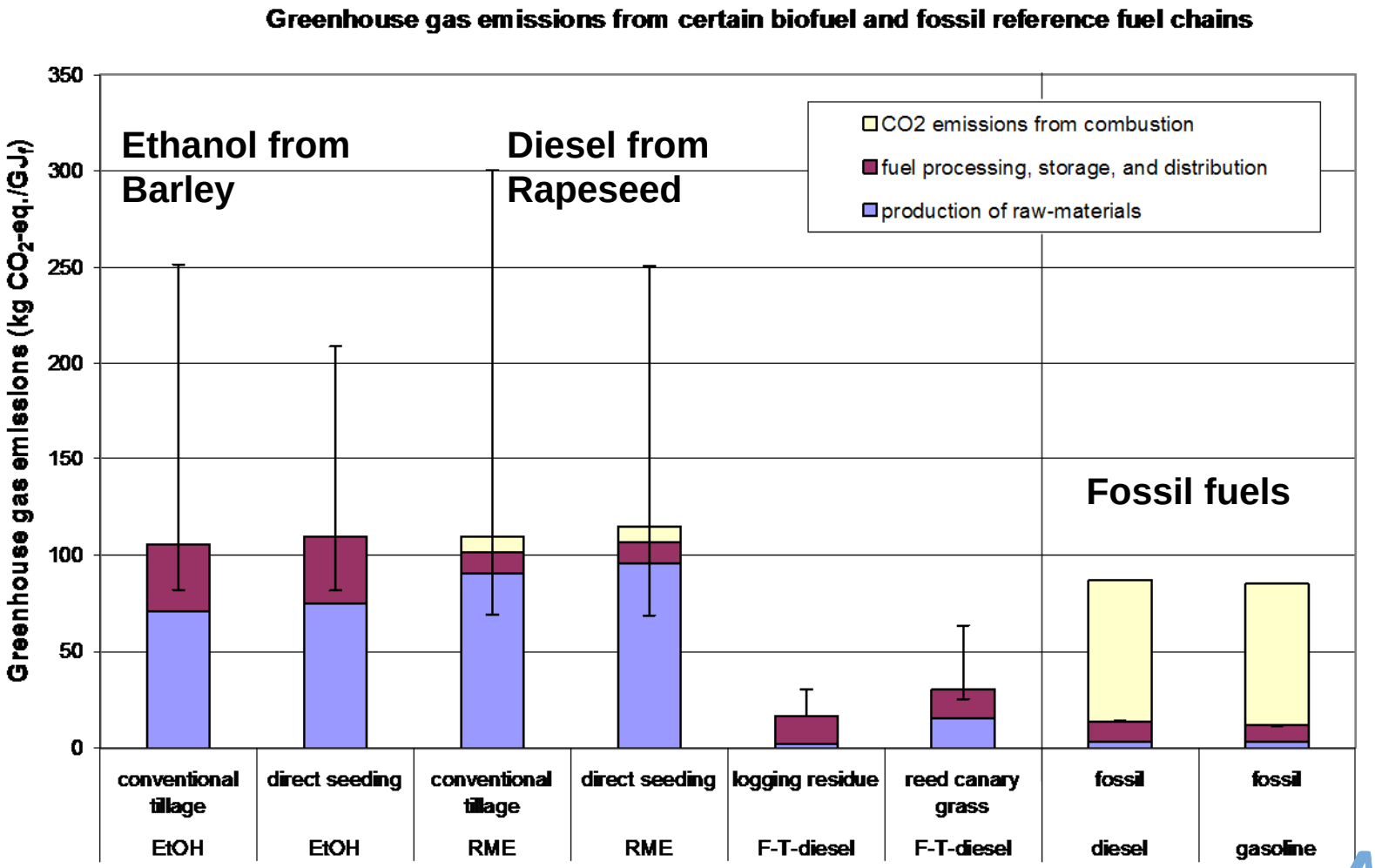
Research Projects:

- Greenhouse gas balances and new business opportunities for biomass-based transportation fuels and agro biomass in Finland (BIOGHG), VTT and MTT
- Production of synthesis gas and ultraclean fuel gas from biomass, peat and wastes (UCG), VTT and HUT
- Liquid biofuels from waste and biomass II, VTT
- Production of bioethanol from Finnish lignocellulosic agricultural residues (AGROETA), VTT and MTT

- Industrial Projects:
- New business concepts of forest and energy clusters, UPM-Kymmene, VTT, Pöyry and ten forest cluster companies
- A new concept for producing fuel ethanol, St1 Biofuels Oy
- BioComp - Biomass based traffic fuel Components, Neste Oil
- NExBTL - Further development of biodiesel technology, Neste Oil

http://www.tekes.fi/biorefine

Greenhouse gas emissions from certain biofuel and fossil reference fuel chains



Mäkinen, Soimakallio et al, 2006. VTT Research Notes 2357.

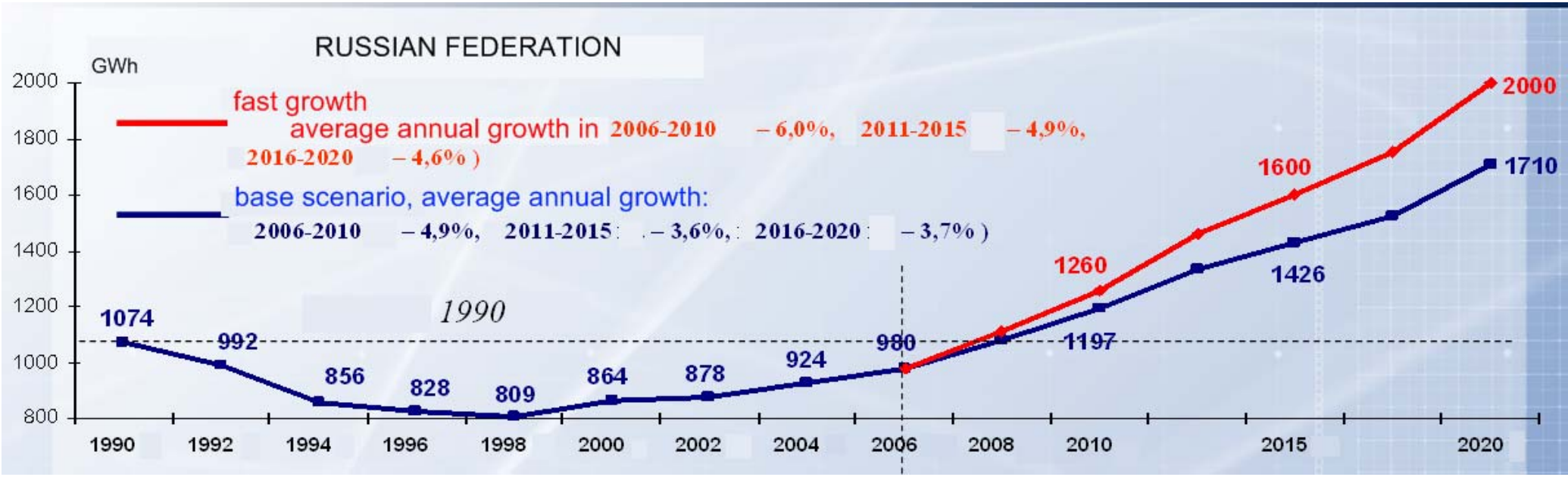
INTERNATIONAL ENERGY MARKETS AND EMISSIONS

- Today EU imports 57% of its gas consumption. Import dependence is expected to increase to 84% by 2030, largely from Russia and the newly independent states.
- Gas use is expected to increase as a result of increasing energy demand in Europe and the expanded use of gas as a climate change mitigation measure.
- All gas consumed in Finland and about 10% of electricity is imported from Russia.
- VTT collaborates with the Bank of Finland's Institute for Transition Economies (BOFIT, http://www.bof.fi/bofit) on research of the Russian energy sector.

Photo: Laura Solanko, Bank of Finland.

ENERGY DEMAND IN RUSSIA IS ALSO INCREASING

Electricity consumption forecast



Source: General Scheme for the installation of Electricity Industry Facilities until the year 2020. Russian Ministry of Industry and Energy.

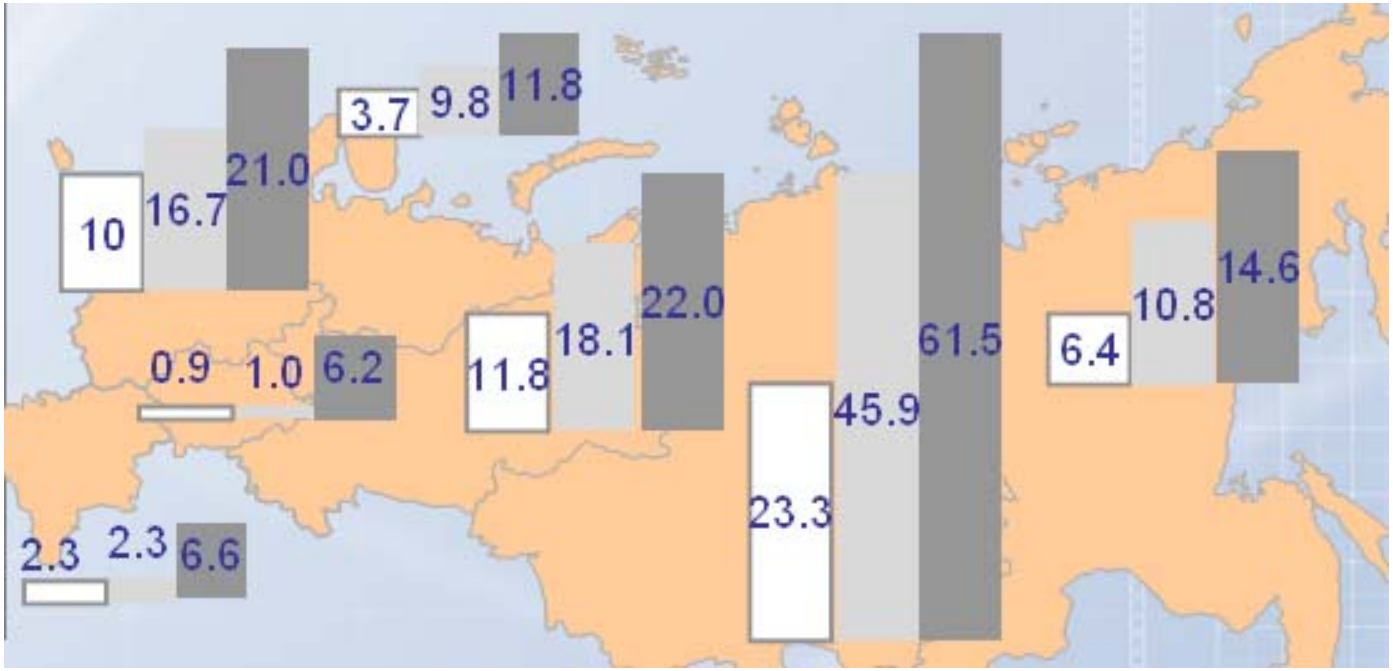
- Since 1999, Russia is experiencing a period of significant economic growth

RUSSIA IS INVESTING IN NEW CAPACITY

- Very significant new investment programme:
  - 53-90 GW coal-fired
  - 74-76 GW gas-fired
  - 32-38 GW nuclear
  - 25-30 GW hydro power

(EU-27 total coal-fired capacity was 200 GW in 2006)

Coal-fired capacity in 2006-2020 (GW)



Source: General Scheme for the installation of Electricity Industry Facilities until the year 2020. Russian Ministry of Industry and Energy.

SUMMARY

- Both the Academy of Finland and Tekes are key funders of PhD studies and research infrastructure in Finland. There is presently a strong emphasis on energy technology development, climate change mitigation and 2nd generation biofuel development.

- Researcher exchange is strongly promoted: planned exchange abroad is a strong merit for the application.

- Regional research in Finland on energy, climate change mitigation and air pollution is not limited to the EU regions. Developments in these fields in the EU and Russia are linked in many aspects.