



energy  
visions

2050

Energy Visions 2050 -  
Objectives and implementation of the project  
Global challenges for the energy sector

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Business from technology

## OBJECTIVES OF THE PROJECT

- Objective: to study long-term energy sector challenges (by 2050) and measures to meet with them
- Measures enabled by technology emphasized
- Whole energy chain covered: energy conversion, end-use, transmission and distribution technologies
- The challenges are approached from global viewpoint, Finnish technology solutions emphasized

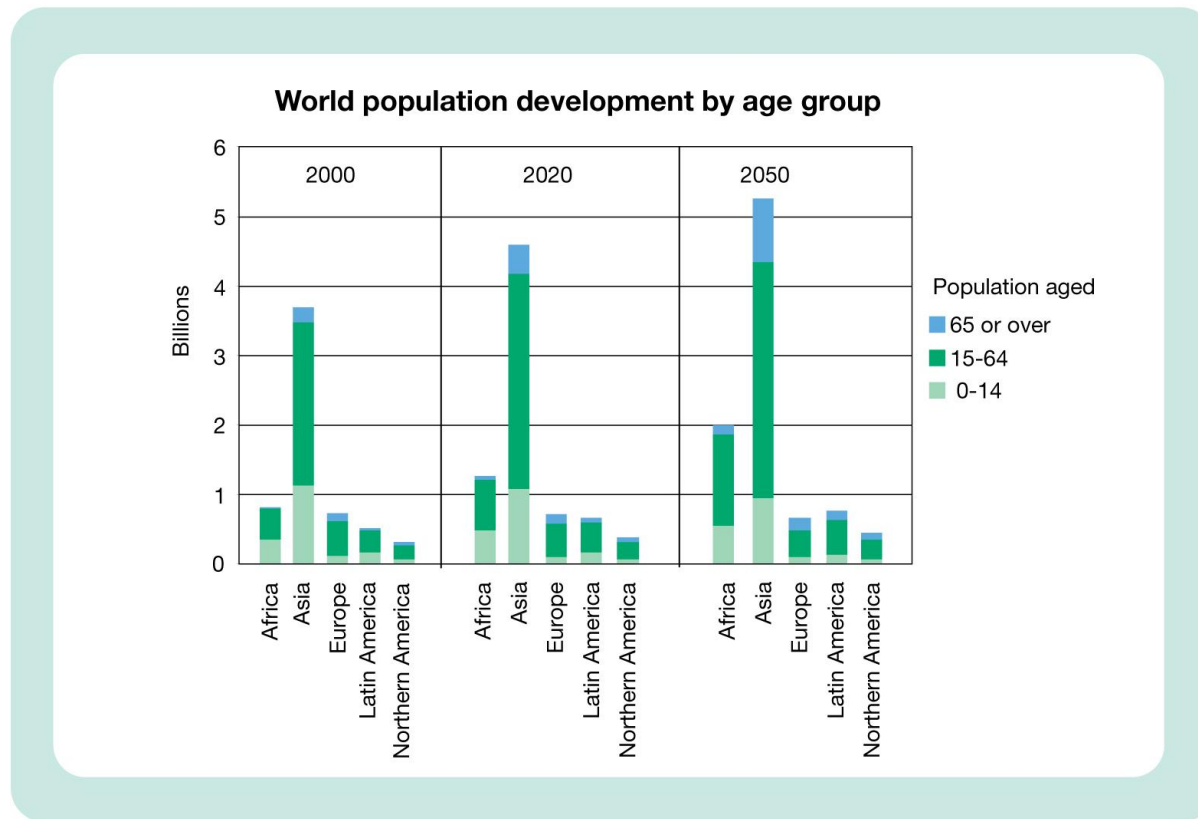
## IMPLEMENTATION, PROJECT PARTIES AND FUNDING

- Dozens of scientists from different technology areas at VTT involved
- Energy system and economic modelling utilised as tools in *scenarios* describing alternative energy futures presented in the book
- World economy scenarios constructed at Government Institute for Economic Research (VATT)
  - Utilised as input data for energy system scenarios by VTT
- The project was funded by ClimBus Programme of Tekes, VTT and VATT

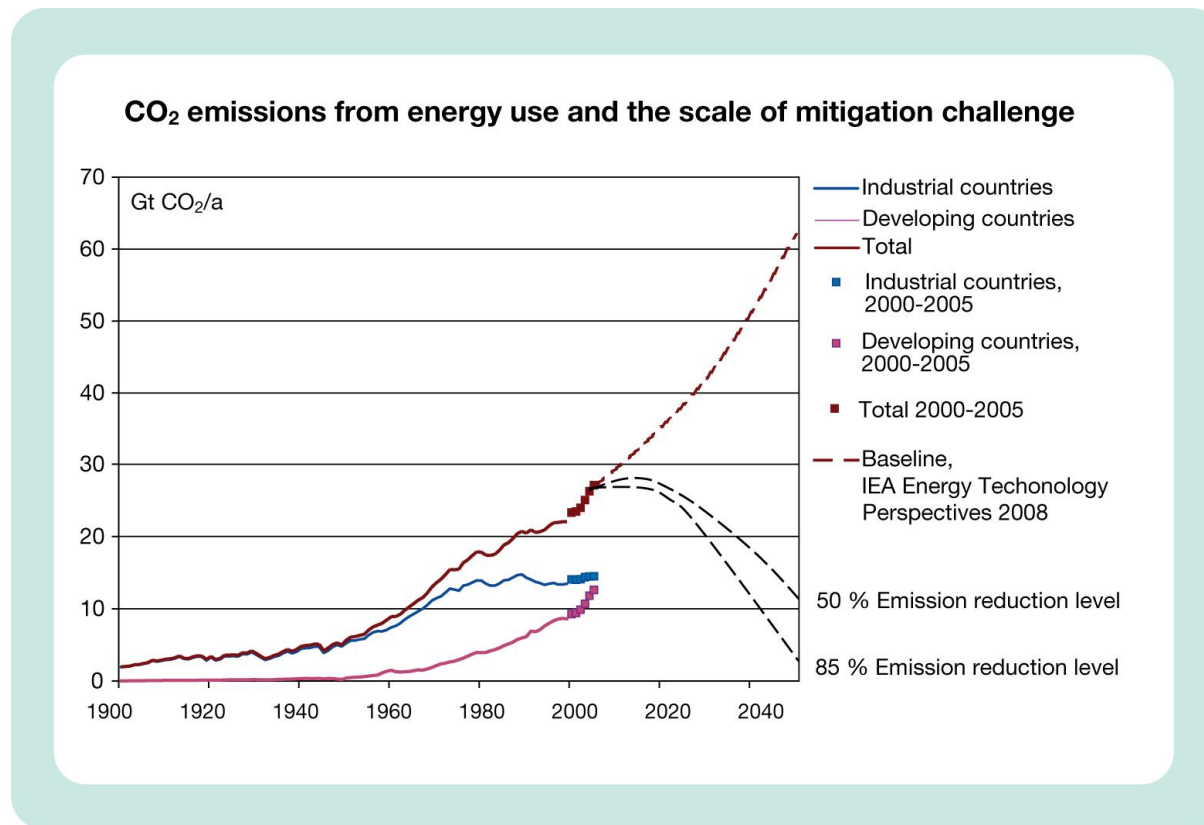
## FURTHER FINNISH AND INTERNATIONAL CO-OPERATION

- BOFIT, Bank of Finland Institute for Economies in Transition:
  - *The energy triangle: the energy supply between EU-Russia-Asia*
- TKK, Helsinki University of Technology:
  - *Lighting technology, solar energy technologies*
- CEA, Commissariat à l'énergie atomique, France:
  - *Nuclear fuel resources*
- MDI, Management Development Institute, Gurgaon, India,  
Professor Arun Sahay: *Distributed Energy: an Indian Perspective*

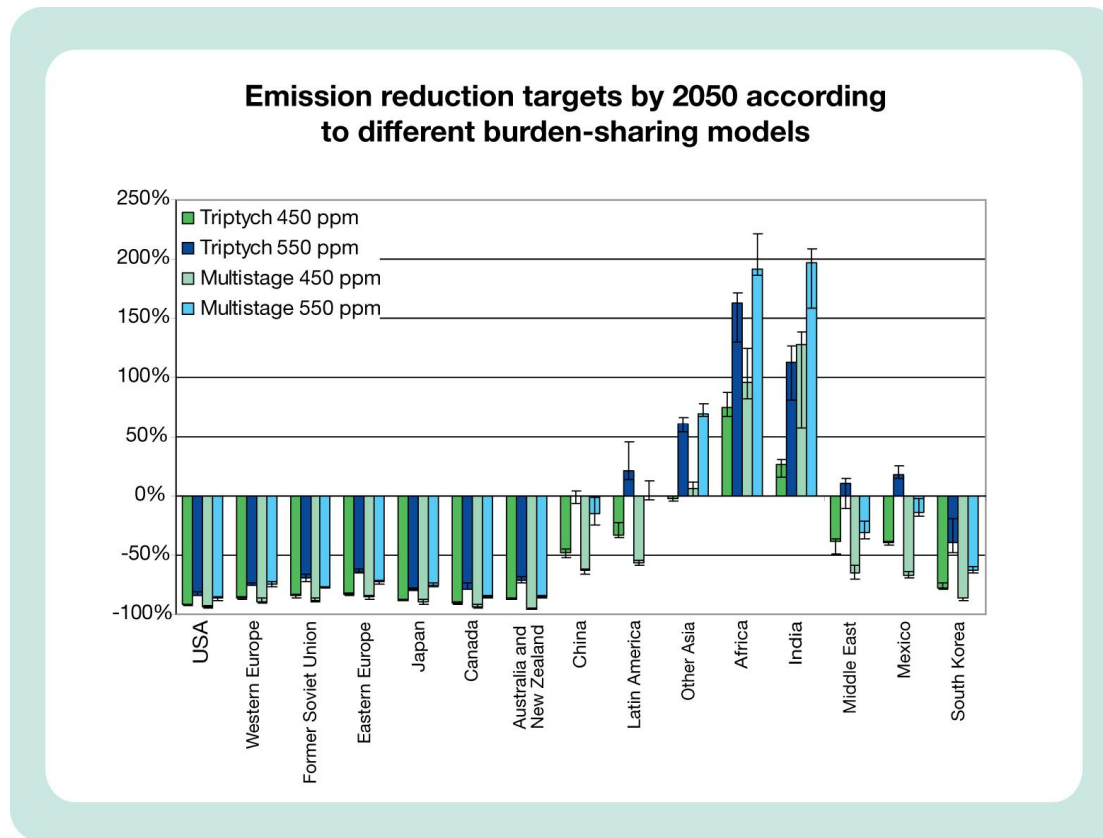
# GLOBAL ENERGY DEMAND DRIVEN BY POPULATION AND ECONOMIC GROWTH



# CLIMATE CHANGE MITIGATION AS A CHALLENGE FOR THE ENERGY SECTOR IN THE FUTURE

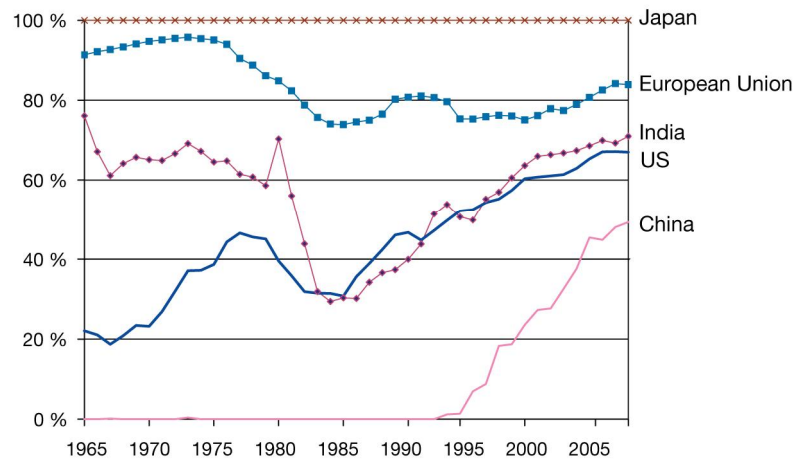


# BURDEN SHARING – AGREEING ON EMISSION REDUCTION TARGETS A KEY QUESTION IN CLIMATE NEGOTIATIONS

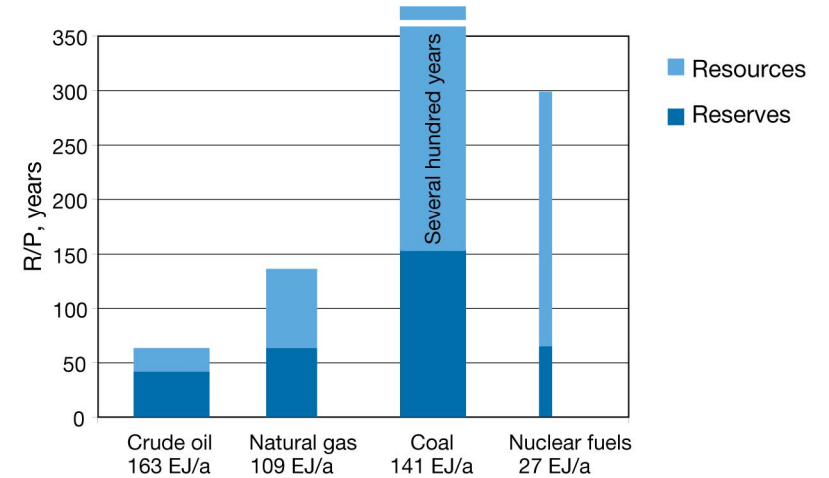


# IMPROVEMENT OF ENERGY SECURITY TO – A FUTURE CHALLENGE ARISING FROM DEPLETING CONVENTIONAL FUEL RESOURCES

The share of imports in oil consumption

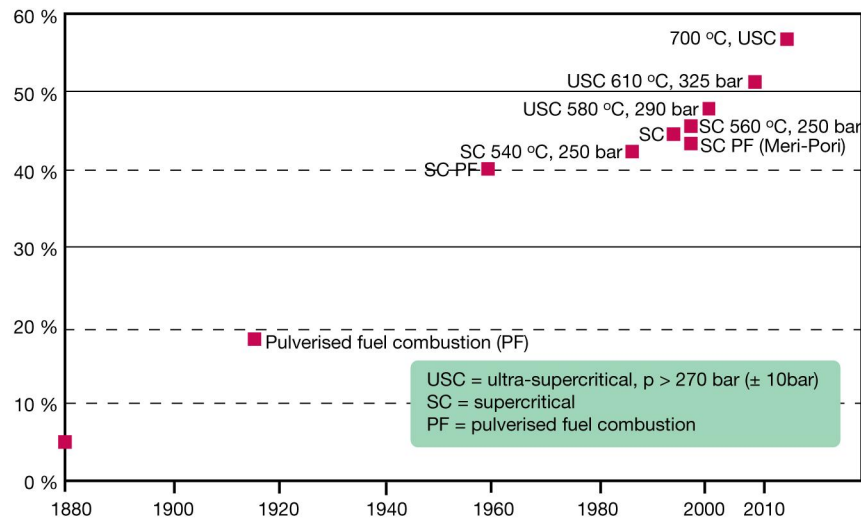


Conventional fuel resources

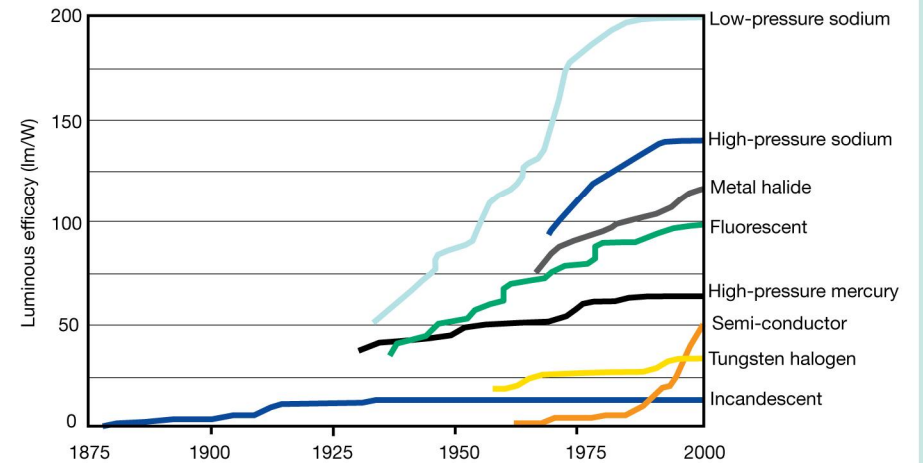


# TECHNOLOGY DEVELOPMENT OFFERS MEASURES TO ADDRESS THE CHALLENGES IN EVERY PART OF THE ENERGY SYSTEM

Efficiency of electricity production

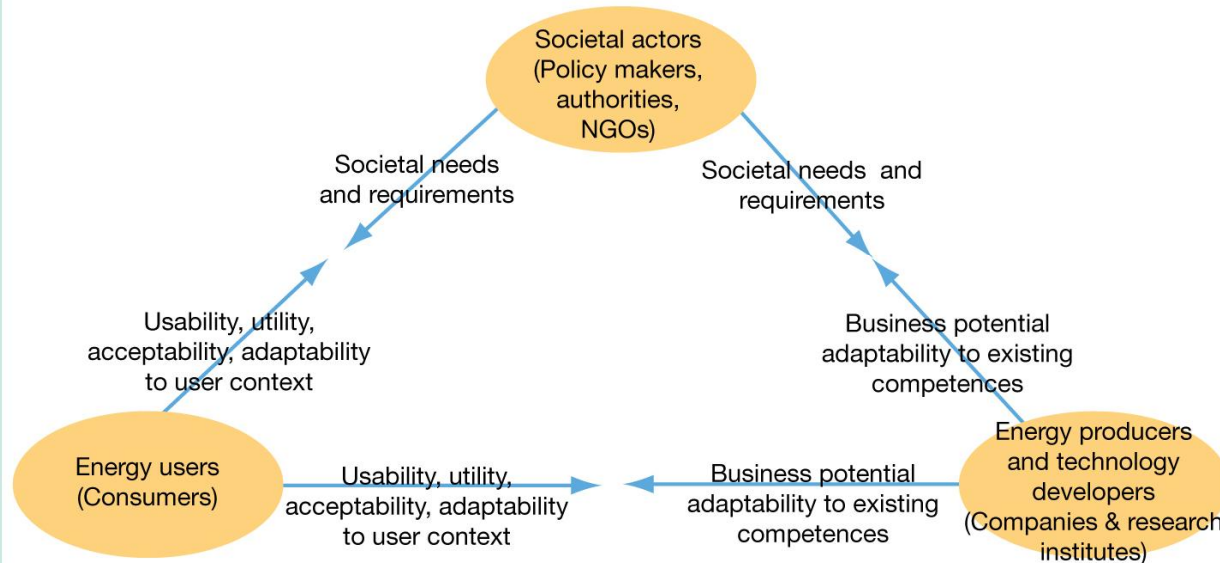


Historic evolution of luminous efficacy for major light sources used in general lighting

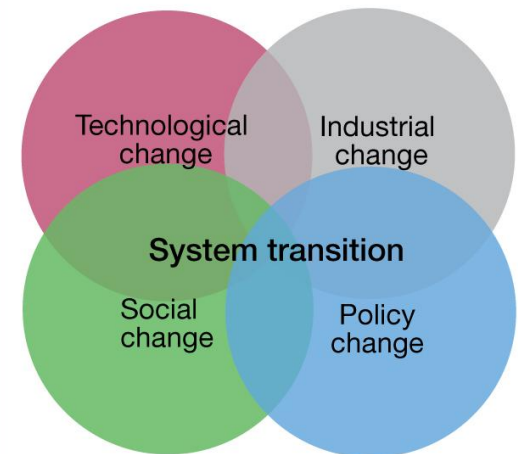


# ENERGY SYSTEM TRANSITION CALLS FOR ACTIONS OF MULTIPLE STAKEHOLDERS AND BUILDS ON SEVERAL DIMENSIONS

Multiple views on developing the energy systems



Linkages between dimensions of system transition





# VTT creates business from technology

