

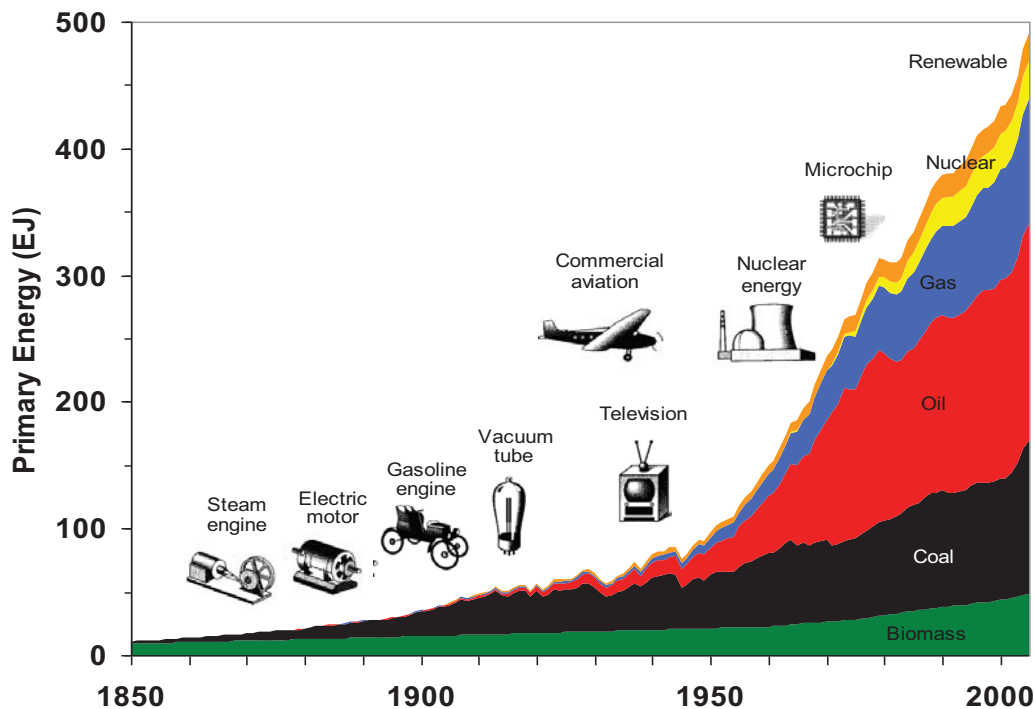
Global Energy Assessment

Thomas B Johansson

Professor, International Institute for Industrial Environmental Economics,
Lund University, Lund, Sweden,

Co-Chair, Global Energy Assessment, IIASA, Austria

World Primary Energy



Source: Nakicenovic et al., 1998

Challenges requiring actions on Energy

- a. Energy services for growing populations and economies
- b. access to modern forms of energy (the ~2 billion w/o access)
- c. affordable energy services (@\$100/bbl??)
- d. secure supplies, from households to nations (“peak”)
- e. local and regional health and environment challenges
- f. climate change mitigation
- g. ancillary risks

=> Major Energy System Changes Needed!

These challenges must be addressed

adequately

timely

simultaneously

this translates into a need for a major energy systems transformation

Main elements:

- Energy end-use efficiency
- Renewable energies
- Carbon Capture and Storage (for CC only)

- **Efficiency and Renewables** are the main **INSTRUMENTS** for addressing all the challenges at the same time!

Assesment

Process leading to a Report and much more

25 Knowledge Modules, ~300 authors, geographically and gender diversified

Stakeholder consultations

External peer review, more than 200 reviewers

Extensive dissemination

Informing Rio +20 and other international, regional, national and corporate processes on energy and/or linked to energy issues

Supporting the GEA:

International Organizations

UNDESA
UNDP
UNEP
UNIDO
World Bank
IIASA

Country Governments/Agencies

Austria
Brazil
European Union
Germany
Italy
Sweden
USA

Corporations

Petrobras
TEPCO
First Solar

Industry groups

WEC
WBCSD

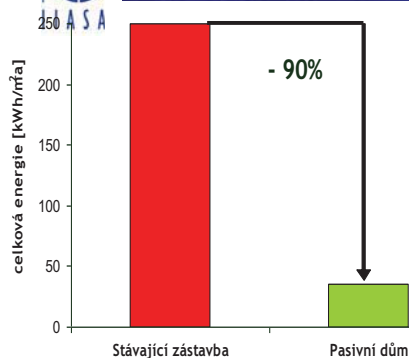
Foundations

UN Foundation
Climate Works

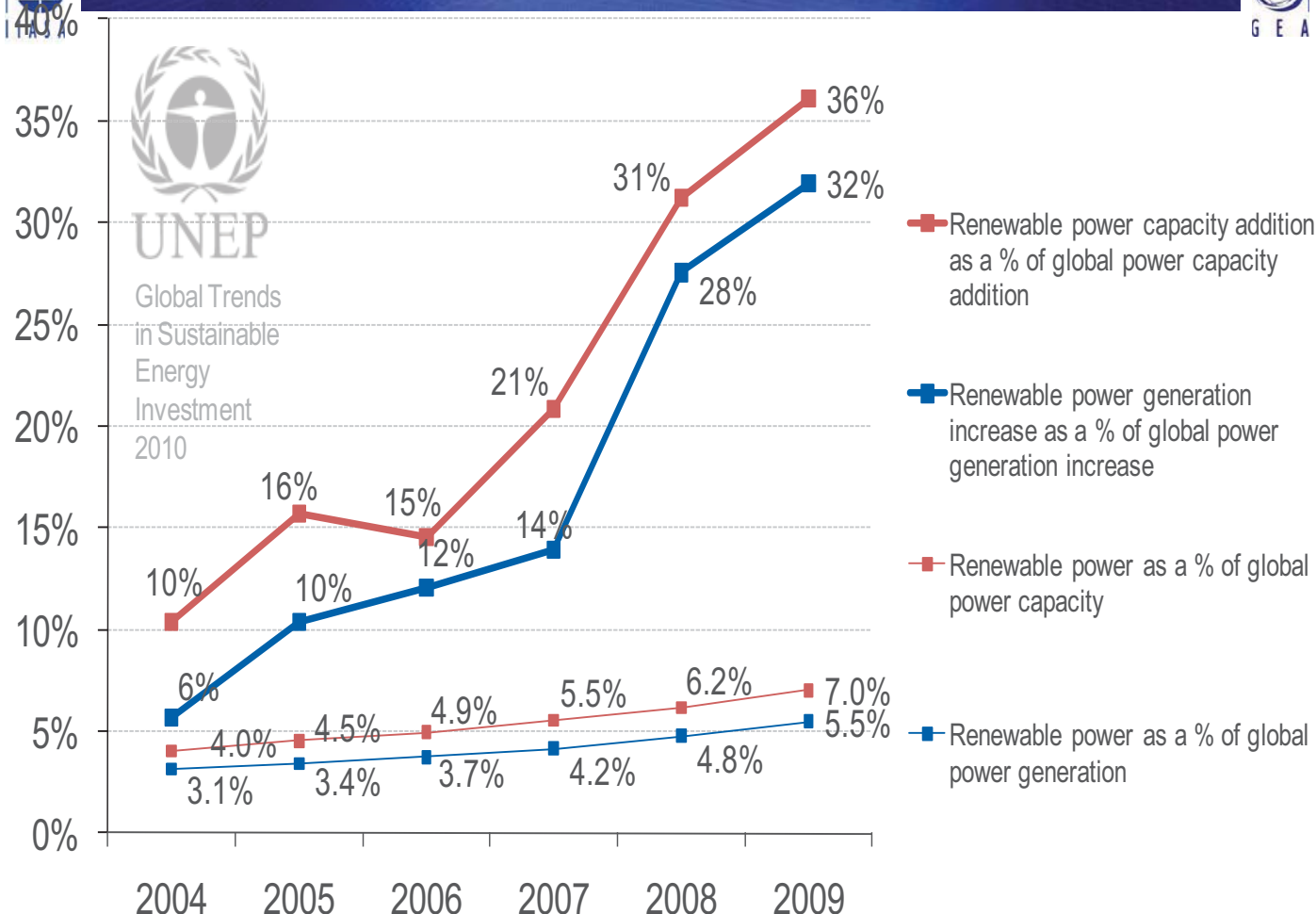
Four Clusters of Knowledge modules:

- 1. The Challenges, nature and magnitude of change required**
- 2. Resources and technology options**
- 3. Pathways to sustainability, urbanisation, rural energy, and land use**
- 4. Policies, energy end use and supply sectors, access, innovation, capacity development**

"PassivHaus"



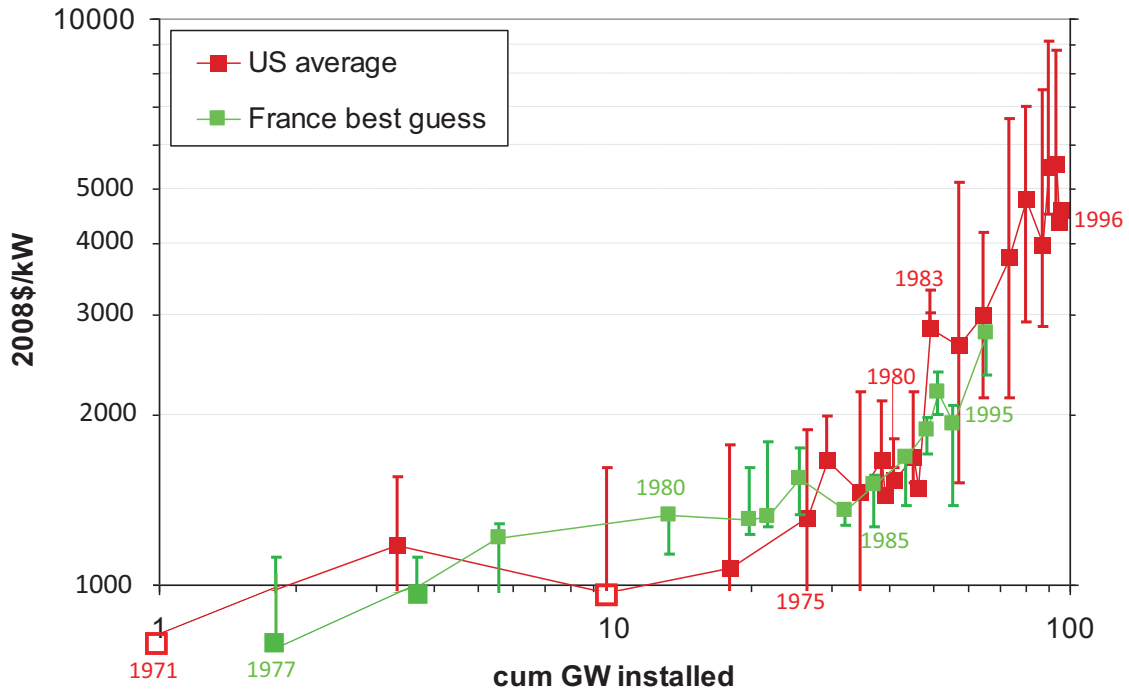
Source: Jan Barta, Center for Passive Buildings, www.pasivnidomy.cz



Excl. large hydro

Nuclear PWR Investment Costs

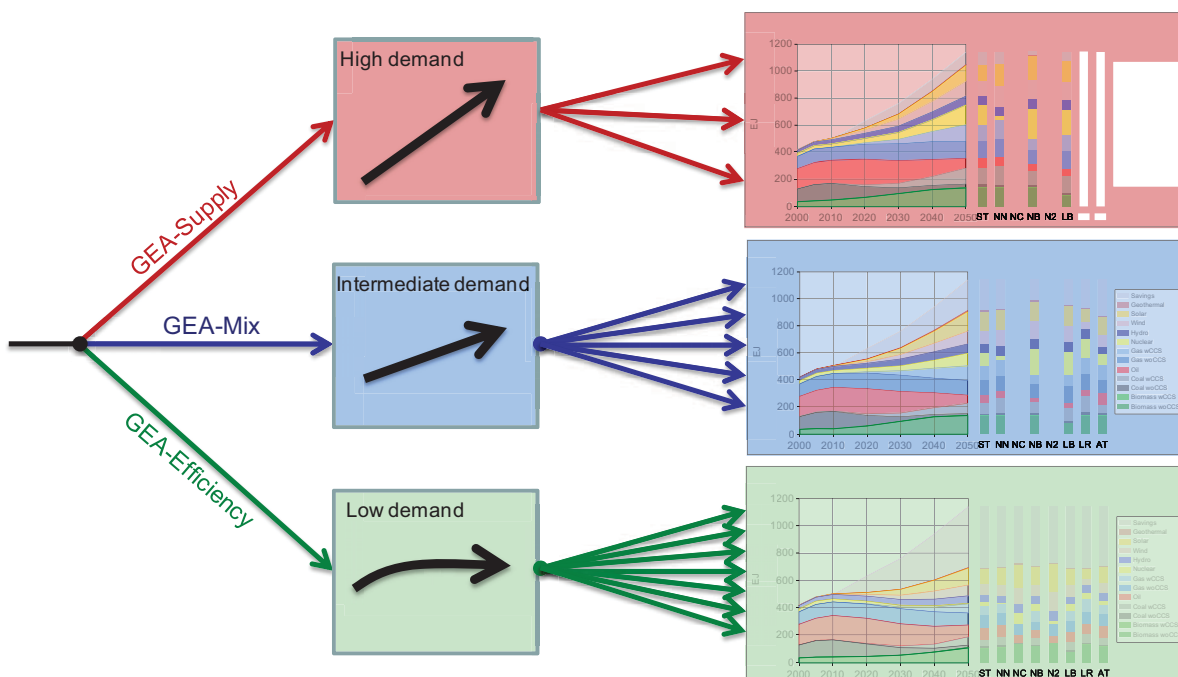
US overnight excl. interest, France partly incl. interests
 mean/best guess and min/max of costs



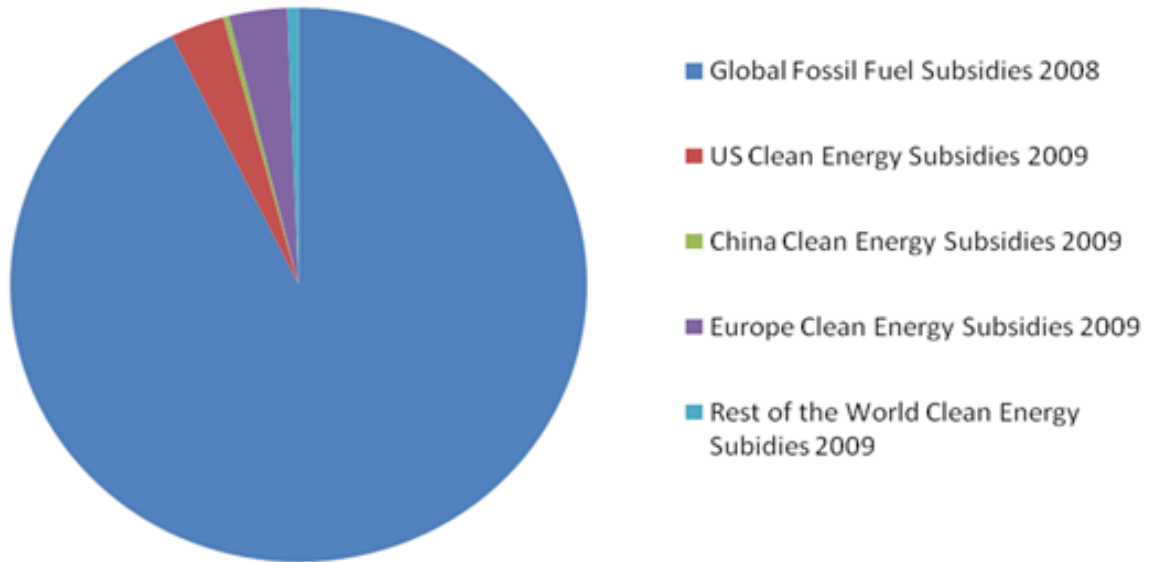
US: Koomey&Hultman, 2007, France: Grubler, 2009

Source: GEA KM24 forthcoming

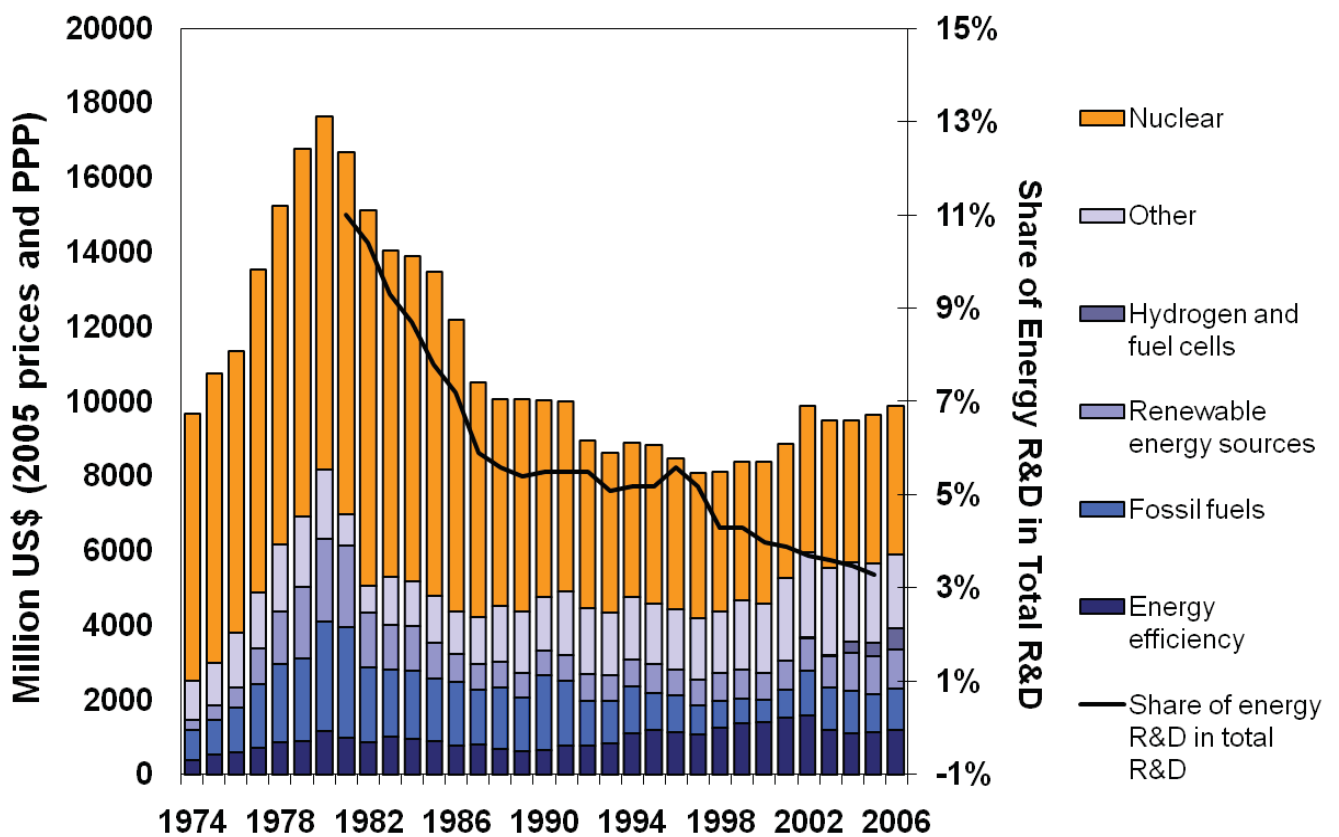
Global Energy Assessment (GEA) Pathway Taxonomy



Global Energy Subsidies (source Bloomberg New Energy Finance)

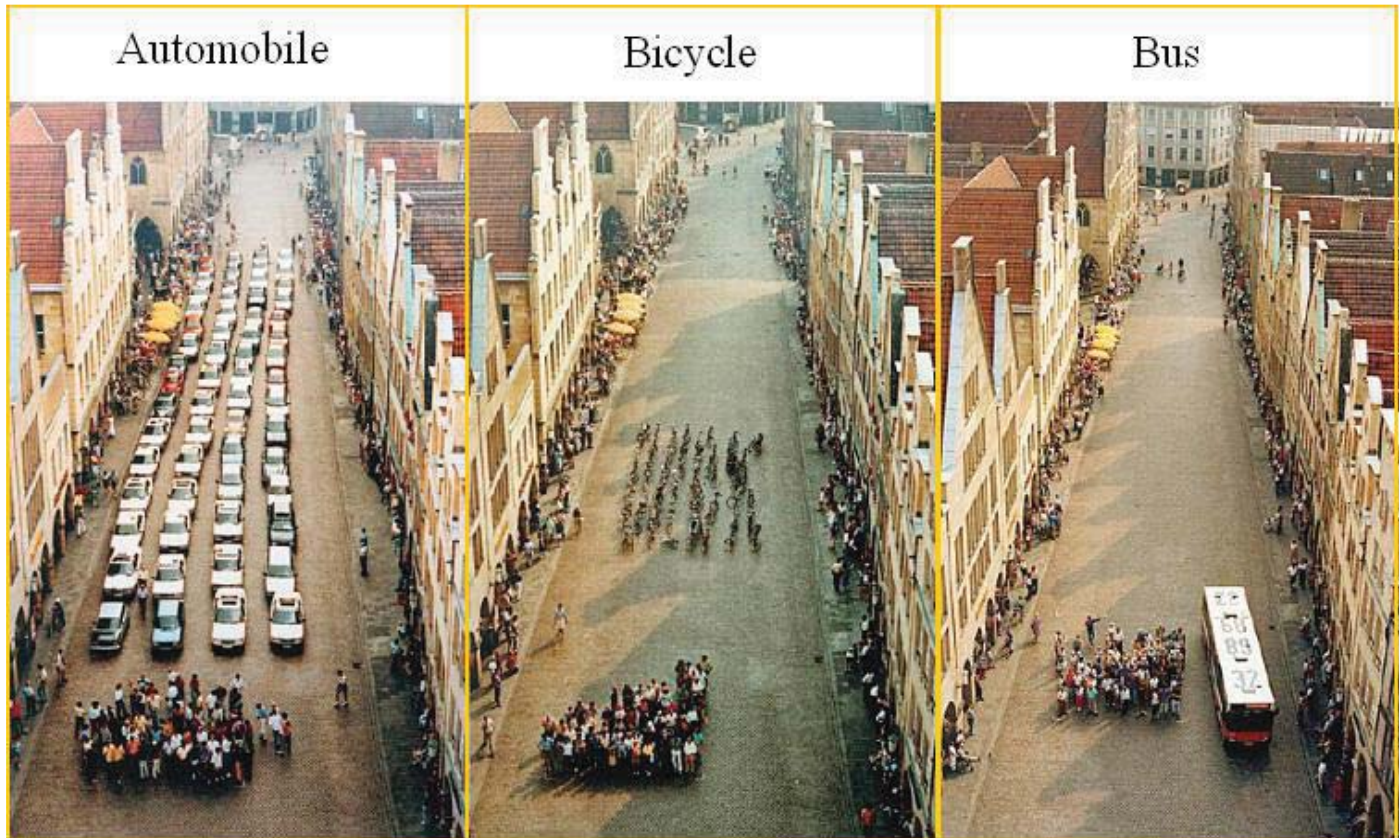


Public Energy R&D in OECD



Source: IEA, 2008

Area Occupied by Various Transport Modes



Source: WBCSD, 2005

not just energy technology

- Urban planning
- Transportation systems
- Material use
- Land use
- Consumption patterns
-

Economic development and poverty alleviation while mitigating climate change

- Multiple benefits concept
- Value **all** benefits (jobs, growth, security, health, local environment, ...)
- Costs in terms of € per tC misleading

- Energy efficiency
- Renewable energies

Major findings and conclusions

- Rapidly changing world
- Transformative changes needed on energy
- Window of opportunity exists
- Resources and technologies exist
- Rapidly growing role for renewable energies
- Electricity growing importance
- Policies and institutions critical
- Energy subsidies and R&D misallocated
- Capacity development worldwide

Thank you!

www.globalenergyassessment.org