

ISCN – GULF Conference

Sustainable academic & corporate campuses:

Time to implement

Track B: University & Sr. corporate leaders

Lausanne – EPFL

June 11 & 12, 2009

Agenda – June 11

- | | |
|---|---|
| 13:30 Welcome and opening remarks | P. Aebischer
H. B. Püttgen |
| 13:50 Setting the stage presentations | R. Stulz
Y. Loerincik
S. Dimolitsas
R. Eichler |
| 15:30 Break | |
| 16:00 Briefing by ISCN Working Group leaders | |
| 16:30 Open discussion | |
| 17:30 Plenary panel discussion | |
| 18:15 Transfer to evening reception and dinner | |

Agenda – June 12

9:00 Setting the stage presentations J. Newman

M. Lehni

J. Mullinix

10:00 EPFL campus visit

11:40 Closing discussion: where do we go from here?

12:45 Buffet lunch

Main R & D Challenges of the 21st Century



- Availability and broad access of reliable and affordable preventative and clinical health services world-wide



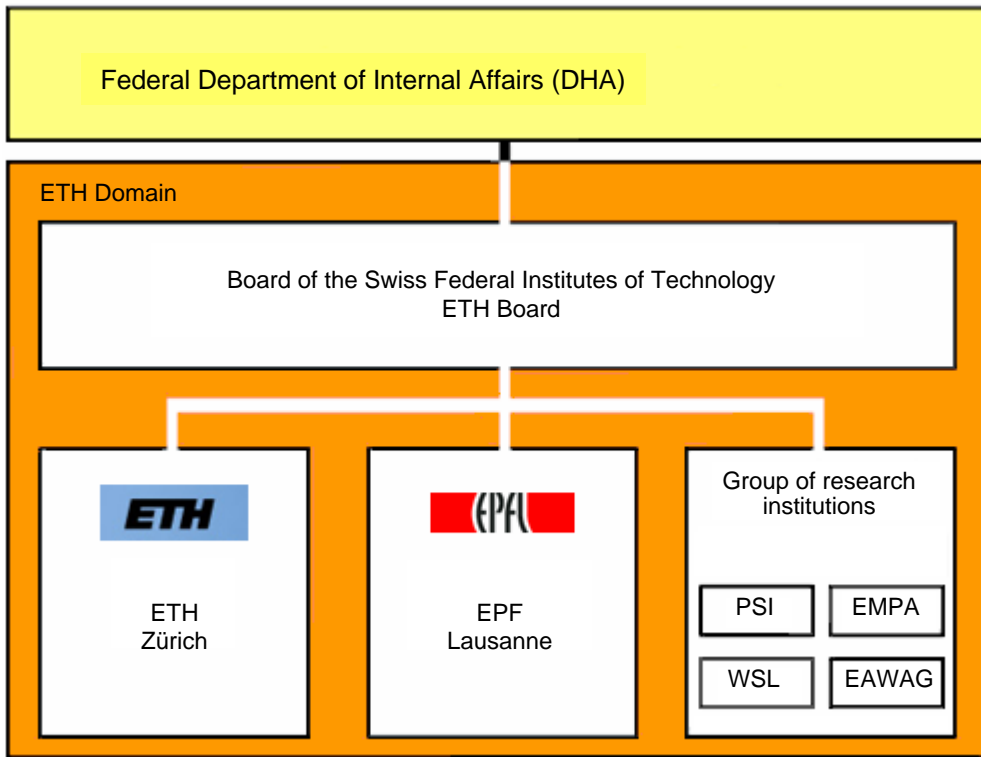
- Production and distribution of food world-wide; conflicts with energy production



- Production, storage, transport, delivery and end-use of energy
- Water resources and cycle**

Major players in the Swiss energy R & D arena

ETH (Swiss Federal Institutes of Technology) Domain



Competence Center Energy & Mobility

Universities - Cantons



Universities of Applied Sciences

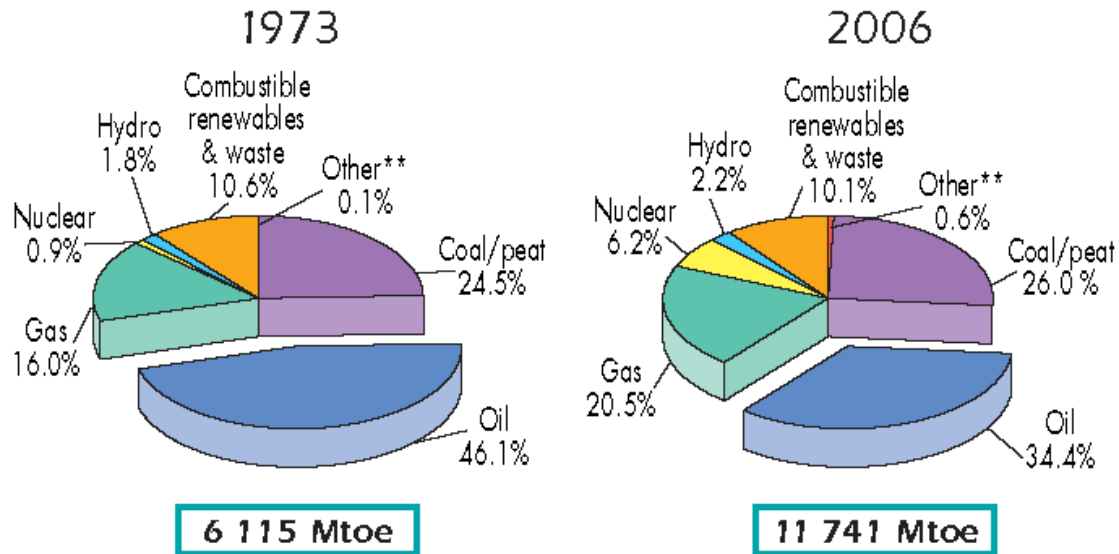


Background: demographic explosion

By 2050, the world population will consist of:

- 3 billion people who will be « energy affluent »
- 3 billion people who will be « energy poor »
- 3 billion **new** inhabitants of the our planet, primarily living in « energy poor » regions of the world.

Primary energy world wide



Source: IEA 2008

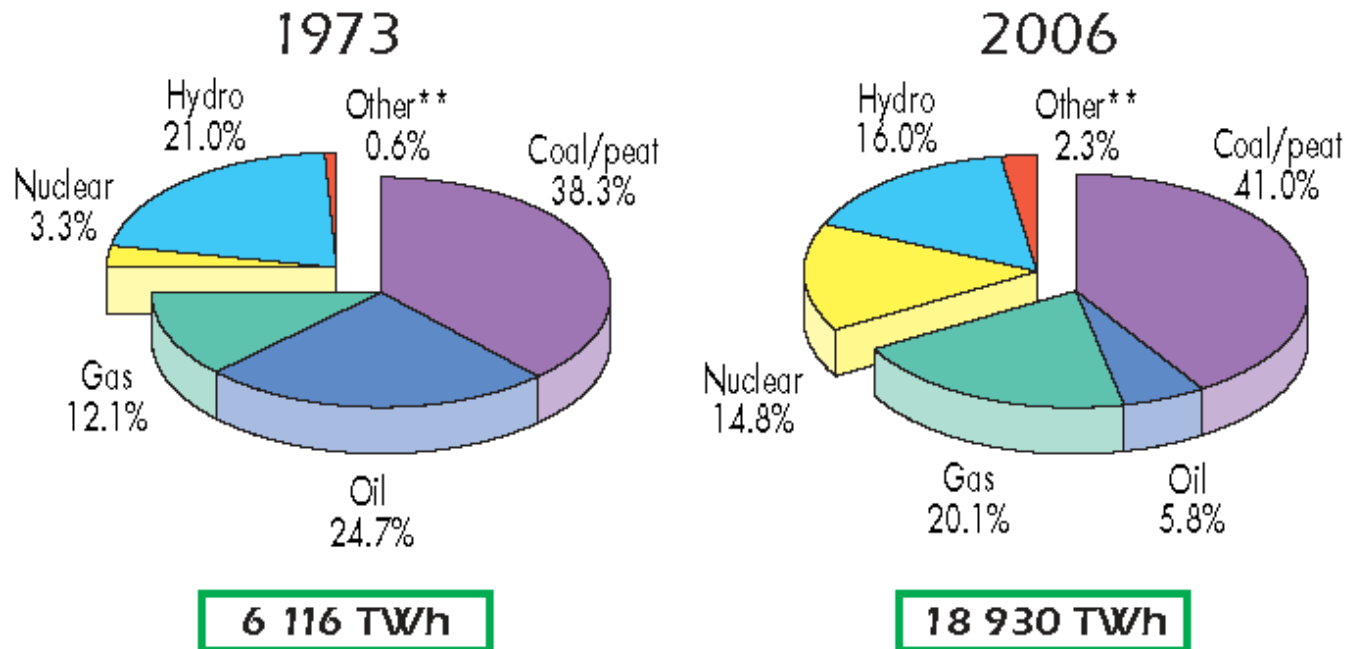
	1973	%	2006	%	croiss.
OECD	3'747	61%	5'590	48%	149%
Non OECD	2'368	39%	6'151	52%	260%
	6'115		11'741		192%

*Exclude electricity trade

**Other includes geothermal, solar, wind, heat, etc.

The energy growth primarily takes place outside of the OECD

Electricity production world wide



*Excludes pumped storage.
**Other includes geothermal, solar, wind, combustible renewables & waste, and heat.

Source: IEA 2008

Primary energy growth: 192 %

Electricity growth: 310 %

The electrification of the world increases quickly

Green house gas emissions: CO₂

Switzerland

CO₂ emissions per capita: 5.95 tons

CO₂ emissions per GDP: 0.18 kg/US\$

Austria

CO₂ emissions per capita: 9.19 tons

CO₂ emissions per GDP: 0.37 kg/US\$

France

CO₂ emissions per capita: 6.22 tons

CO₂ emissions per GDP: 0.27 kg/US\$

Germany

CO₂ emissions per capita: 10.29 tons

CO₂ emissions per GDP: 0.43 kg/US\$

World

CO₂ emissions per capita: 4.18 tons

CO₂ emissions per GDP: 0.76 kg/US\$

Europe 25

CO₂ emissions per capita: 8.46 tons

CO₂ emissions per GDP: 0.44 kg/US\$

North America

CO₂ emissions per capita: 19.49 tons

CO₂ emissions per GDP: 0.55 kg/US\$

China

CO₂ emissions per capita: 3.65 tons

CO₂ emissions per GDP: 2.76kg/US\$

Two types of challenges

From the data given above, one should come to the conclusion that there are two types of challenges:

- In industrialized countries, the challenge is the rational – sober - utilization of energy.
 - Energy efficiency

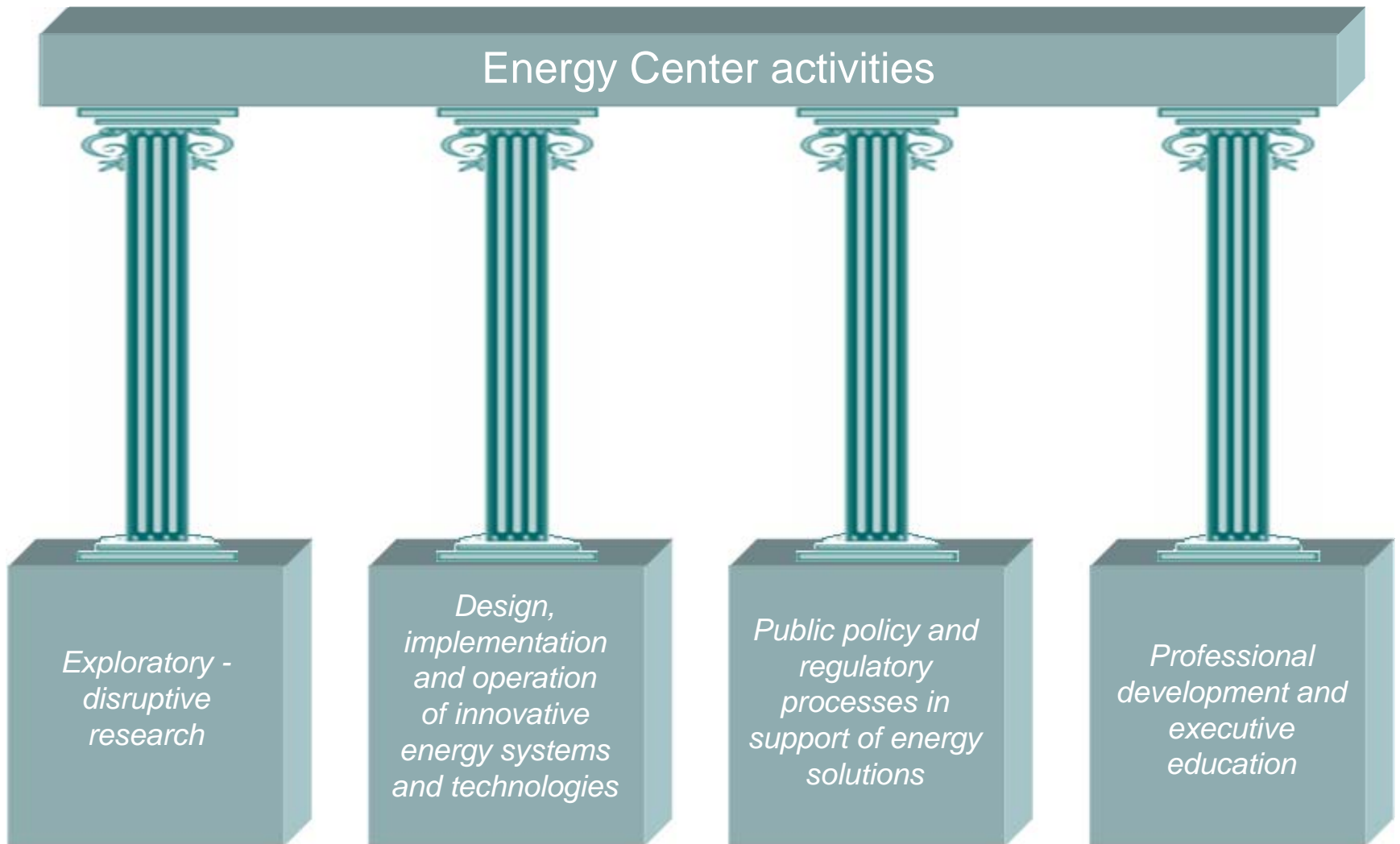
- In emerging countries, the challenge is a massive increase in energy production while avoiding a catastrophic impact on the environment.
 - Environmental impact

EPFL Energy Center vision

Development of sustainable energy production, storage, transportation, distribution, and end-use systems and technologies.

Proactive engagement in the formulation and implementation of the private and public sector policies and strategies required to achieve such development.

Position EPFL as the indispensable partner for the private and public sectors in these activities



EPFL energy research focus areas

Renewables

- Hydro Turbines
Civil engineering
Electrical machines
Power electronics
- Wind Environmental simulations
Environmental monitoring
- Solar Thin-film
Dye cell
- H₂ PEC technologies
Materials for storage

EPFL energy research focus areas

Energy processes

- Electric power systems – distributed electric systems
- Buildings Energy management
 - PV integration
 - Renovation technologies and processes
 - Heat pump technologies & integration
- Industry Multi-energy systems and networks
 - Heat pump systems development
 - Energy balance studies
- Clean transportation systems
- Urban energy systems

EPFL energy research focus areas

Nuclear

- Controlled fusion
- Nuclear reactor safety

Regulatory and Public policy issues

Behavioral modification & energy conservation

The Roundtable on Sustainable Biofuels

An EPFL Energy Center initiative

Ensuring that biofuels deliver on their promise of sustainability



Energy Center RSB Sponsors



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Energy Center

ISCN – GULF; Lausanne – EPFL; Track B; June 11 & 12, 2009



Federating projects

ECLEER : Context and objectives

- In the of a post-petroleum economy:
 - Reduce the CO₂ emission by a factor 4 by 2050
 - Reduce the hydrocarbon dependency
- Two world-leading academic partners with EDF :
 - Ecole Polytechnique Fédérale de Lausanne
 - Ecole des Mines de Paris
- **ECLEER** : European Centre and Laboratories for Energy Efficiency Research

Objectives :

- Accelerate the research and innovation pace
- Federate the efforts of leading institutions

Federating projects

ECLEER – EDF & Ecole des Mines & EPFL

- Four main subjects
 - Heat pumps
 - Industrial processes energy efficiency
 - Buildings and solar systems integrations
 - Socio-economic aspects

Topics for discussion

- How important is it to include sustainability within the « corporate image » of academic or corporate organizations?
 - Marketing & sales
 - Recruitment of best talents
- What are the key elements when implementing a sustainability « état d'esprit » on campus?
 - Positive drivers
 - Obstacles
- Is there a need to propose and establish broadly-agreed upon indicators to « rank » academic institutions as to how « green » they are? If so, how?
- Can joint ISCN – GULF activities, such as this conference, be a « win-win » situation?