

Mineur en Energie

-

Minor in Energy

The Energy Dimension of your Master

Mech. Eng. Section

Dr. François Marechal

MER

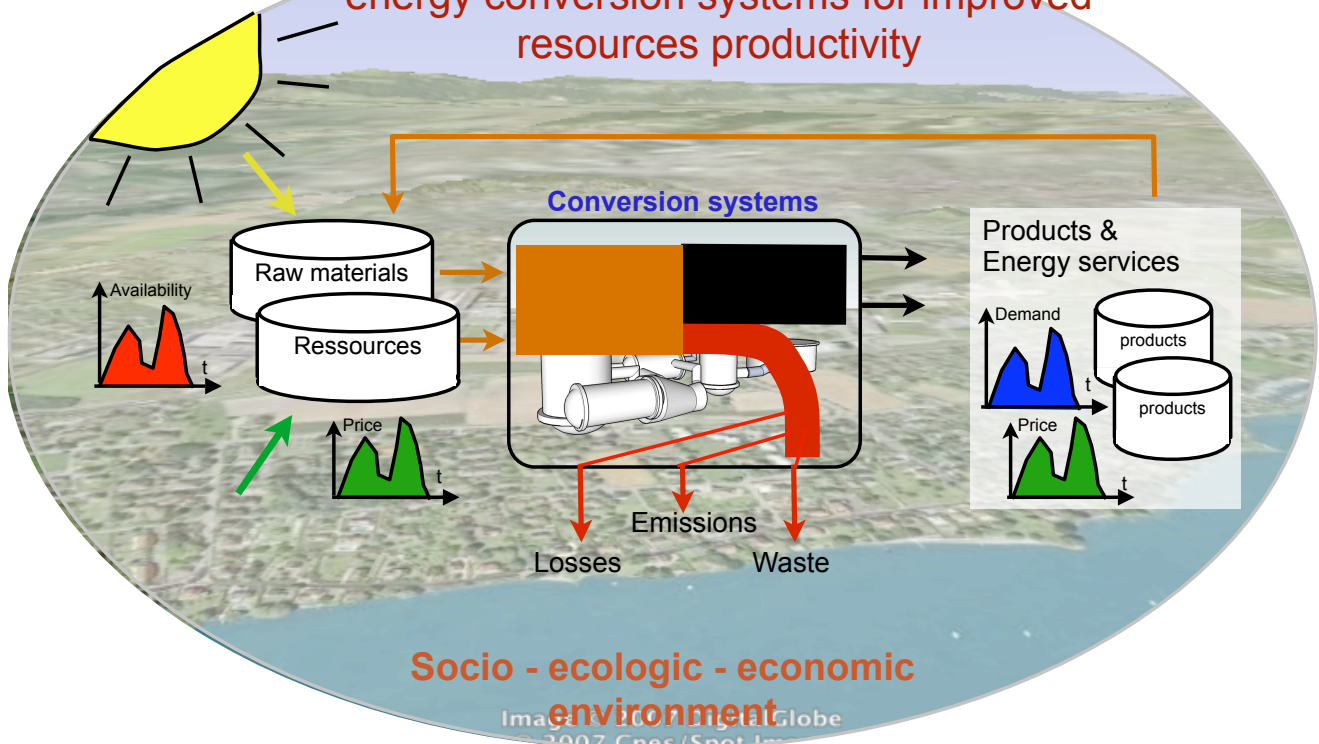
LENI-IGM-STI-EPFL

<mailto:francois.marechal@epfl.ch>

LENI Systems

Energy Dimension of Engineering

Engineer's Challenge : The integration of energy conversion systems for improved resources productivity



francois.marechal@epfl.ch - Laboratory for Industrial Energy Systems - LENI-IGM-STI-EPFL - March 2006



The challenge today ...

▶ Can we survive

- ▶ without nuclear power plants ?
- ▶ with limited CO2 emissions ?

▶ Engineers have to say "yes we can" and we will do ...

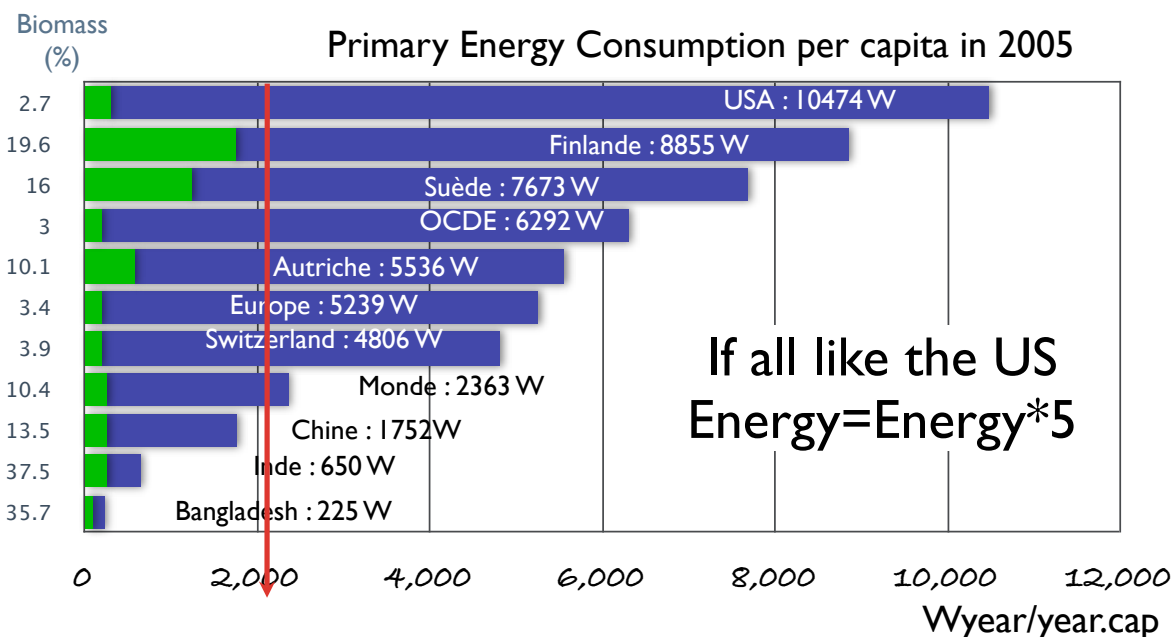
- ▶ the solutions ?
 - ▶ Efficient technologies
 - ▶ Efficiency of systems (cogeneration)
 - ▶ Integrate and convert renewable resources

LENI Systems - Laboratory for Industrial Energy Systems - EPFL - March 2008



The 2000 W society

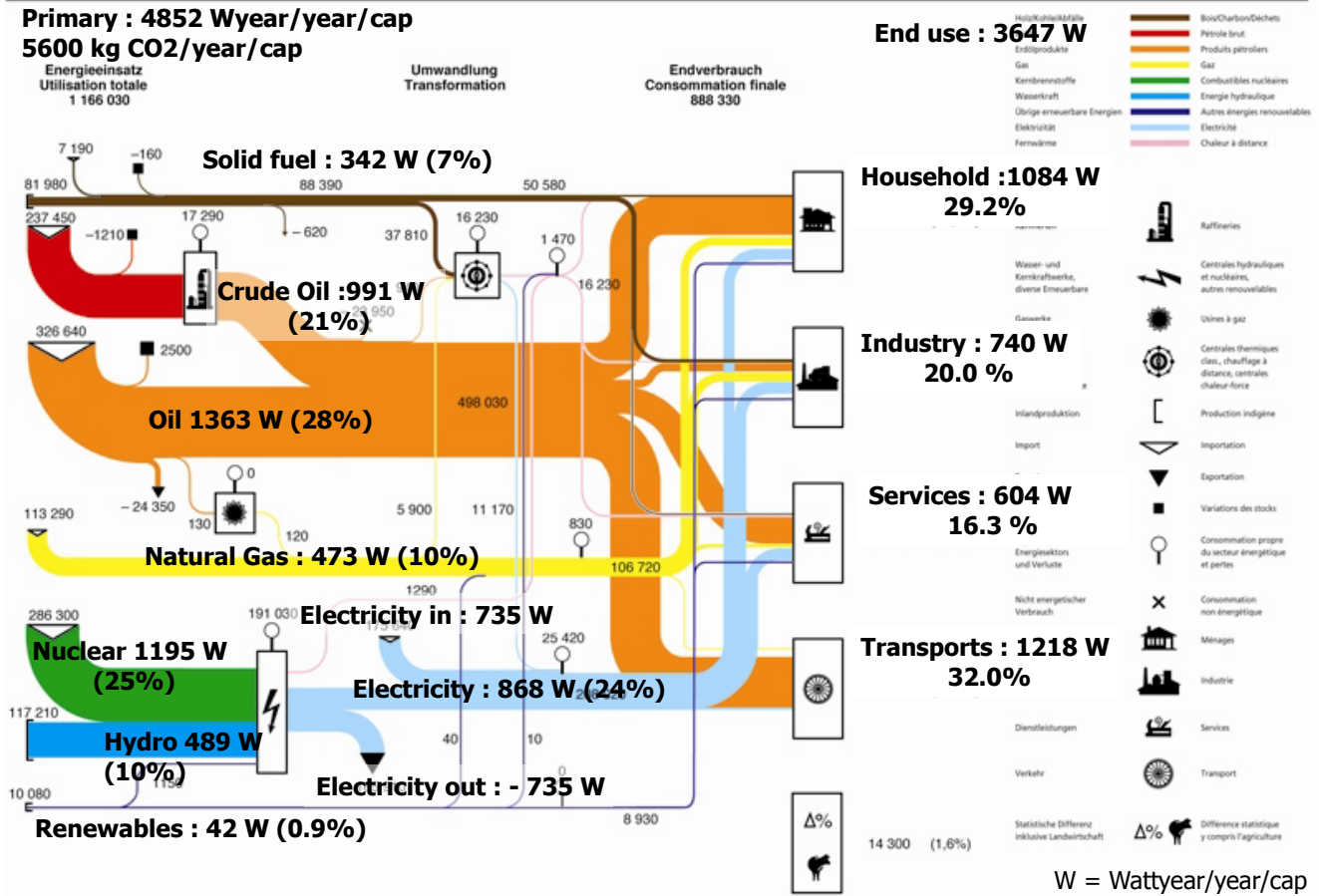
The Swiss Federal Institute of Technology challenge



Source: Key World Energy Statistics, IEA, edition 2007, Renewables Information IEA, edition 2007

Primary : 4852 W/year/year/cap
5600 kg CO₂/year/cap

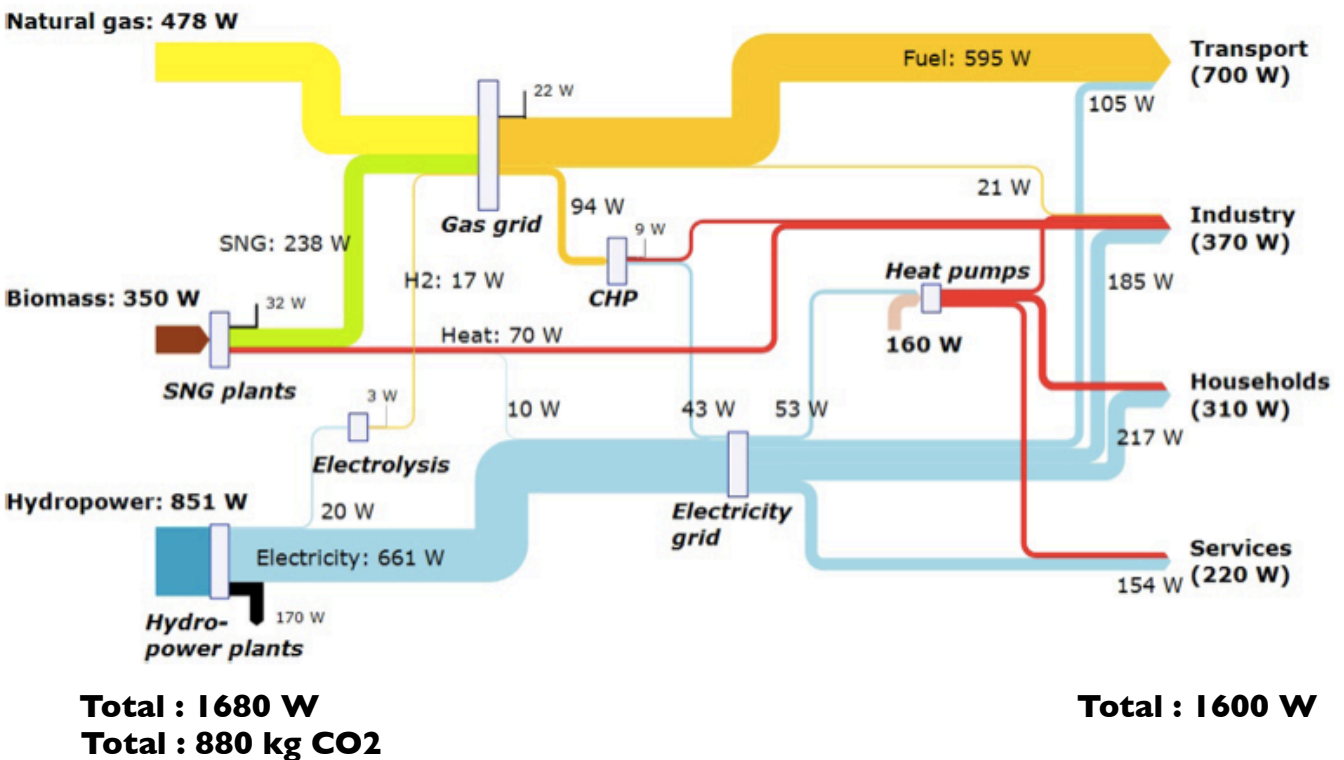
End use : 3647 W



Source : OFEN : <http://www.energie-schweiz.ch/bfe/fr/statistik/gesamtenergie> (2006)
 Quelle: Schweizerische Gesamtenergiestatistik 2006
 Source: Énergie Suisse, statistique globale de l'énergie 2006

ENI Systems

2000 Watt society + 1 tCO₂ : YES we can !



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Minor in Energy :The Energy Dimension of your master diploma !

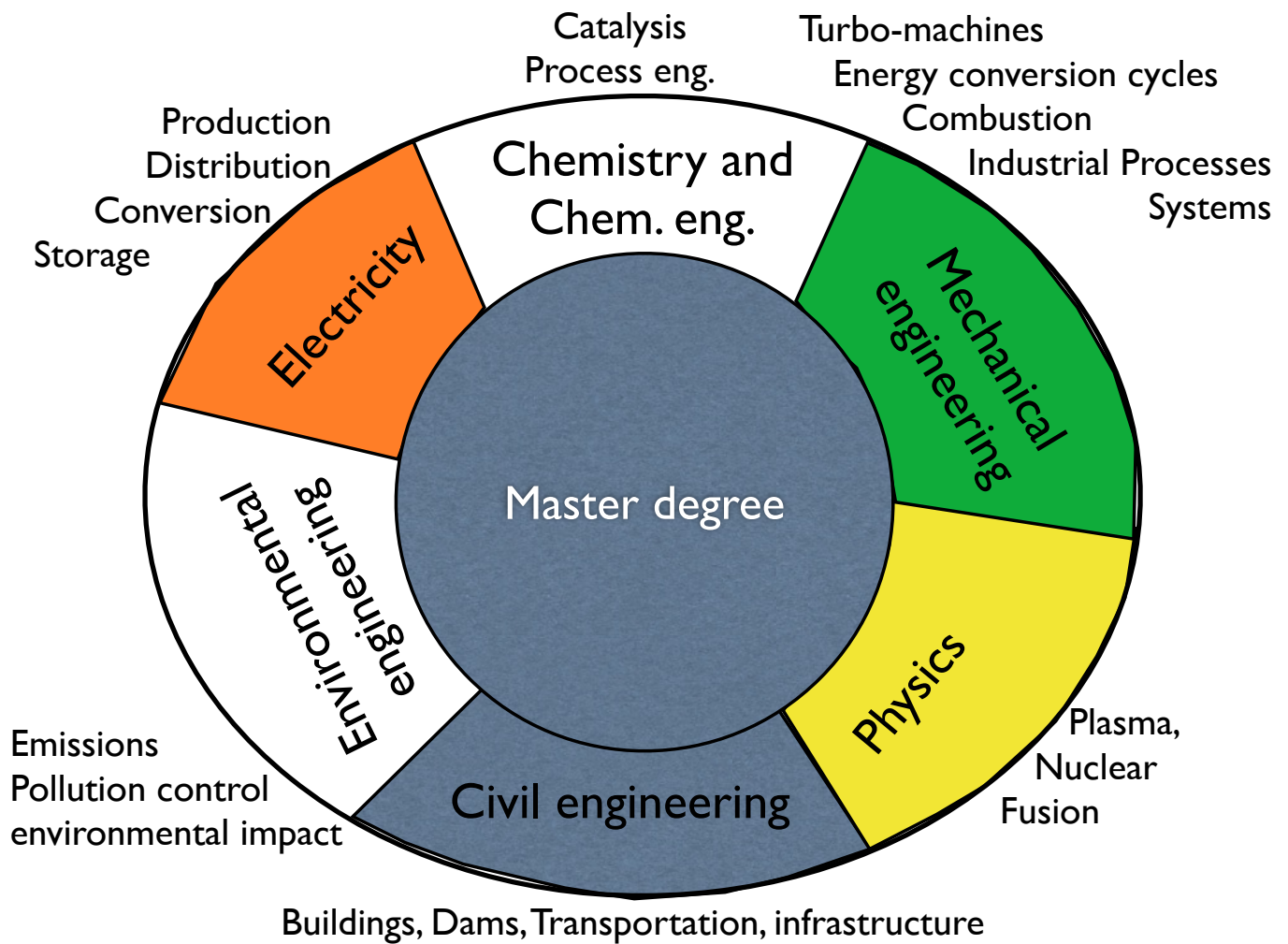
- Add the Energy Dimension to your diploma
 - Multi-disciplinarity
 - Technology - Environment - Engineering
 - Socio-economics (SHS)

The Energy Dimension

▶ **Systemic vision**

▶ **Engineering the integration**

- ▶ Energy **resources** -> **Technology** -> Energy **services**
- ▶ Technology in a **Socio-economic** context
- ▶ Technology in an **Environmental** context
- ▶ Technology in
 - ▶ Industrial processes and systems
 - ▶ **(Renewable)** Energy resources conversion
 - ▶ Energy Management and Control
- ▶ Technology in **Market**



The minor in Energy

- The Energy Group
 - link with PhD Researcher
 - link with industry
 - web site : <http://energy.epfl.ch/w>
 - Projects coordination
 - Rumba, etc...