THE BUILDING CONSTRUCTION SECTOR AND THE LAST DEVELOPMENTS IN ENERGY POLICY

"Past EU initiatives"

ECTP CONFERENCE
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- Ex-Head of Unit of Innovation and Technology development in Energy
DG TREN – European Commission
THE EUROPEAN THREE ENERGY CHALLENGES

Competitiveness “LISBON”

• Renewable energy
• Energy efficiency
• Nuclear
• Research and innovation
• Emission trading

Sustainable Development “KYOTO”

• Renewable energy
• Energy efficiency
• Nuclear
• Research and innovation
• Emission trading

Security of supply « MOSCOW »

• International Dialogue
• European stock management (oil/gas)
• Refining capacity and energy storage
• Diversification

• Internal Market
• Interconnections (Trans-European networks)
• European electricity and gas network
• Research and innovation
• Renewable energies
• Energy Efficiency
  • Hydrogen
  • Clean coal/CO2 capture
  • Smart grids
  • Nuclear fission and fusion
  • Socio-economic research

FULLY BALANCED INTEGRATED AND MUTUALLY REINFORCED
"EUROPEAN COUNCIL OF SPRING 2007"

OBLIGATIONS FOR MEMBER STATES FOR THE YEAR 2020

-20% MANDATORY TARGET FOR THE CONTRIBUTION OF RENEWABLE ENERGIES. MEMBER STATES DECIDE THE QUOTA FOR EACH SOURCE

FOR BIOFUELS 10% IS MANDATORY

- 20% REDUCTION OF TOTAL ENERGY CONSUMPTION (BY APPLICATION OF THE ACTION PLAN ON ENERGY EFFICIENCY)

- UNILATERAL COMPROMISE ON KYOTO (-20%)
<table>
<thead>
<tr>
<th>By source or application</th>
<th>Supply</th>
<th>Demand</th>
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<tbody>
<tr>
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<td>BU</td>
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<tr>
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<td>Solar Thermal</td>
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<td>EE in Buildings</td>
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<td>EE in Industry</td>
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<td>EE in Transport</td>
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<td>EE in generation and conversion</td>
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<td>EE in transport and distribution of energy</td>
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DRAFT ANALYSIS
OF THE 20% OBLIGATION IN
ENERGY EFFICIENCY

1. Final Energy Consumption in Europe:
   - Buildings: ~40%
   - Transport: ~32%
   - Industry: ~28%

2. Expected reduction in buildings: 20% of 40%  
   <> 8% of total <> 120Mtoe

3. From where this 8% for 2020?
   - Existing stock of buildings: no much, if they are not rehabilitated
   - Retrofitting of old buildings: important effort in each retrofitted building, by application of the EPBD
   - New buildings: the intensity of the effort to be concentrated in new buildings. How much reduction in each new building: 50%?, 60%?... or more?
1. Expected RES contribution in 2008:
   - Very maximum optimistic of 8.5%

2. Increase of RES from 2008 to 2020:
   - Minimum of 11.5% (more in terms of primary energy)

3. Potential sectorial increases:
   - Supply: maximum optimistic of 6.5/7.5%, including biofuels and transport
   - Demand: the rest (4/5%)
     - Industry: maximum optimistic 1% (mainly wastes)
     - Buildings: 3/4%, let’s take 3.5%, equivalent to more than 30% of the total increase. **Probably more!!!**
## HYPOTHETICAL SCENARIO

### EU TOTAL ENERGY CONSUMPTION

<table>
<thead>
<tr>
<th>CONCEPT</th>
<th>OBLIGATION EE (ACTION PLAN)</th>
<th>OBLIGATION RES</th>
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<tr>
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<td>EU TOTAL ENERGY CONSUMPTION</td>
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<td>% Mtoe</td>
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<td>2008 (Mtoe)</td>
<td>2020 (Mtoe)</td>
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<td>% Mtoe</td>
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### ENERGY CONSUMPTION

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<td>100%</td>
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<td>2008 (Mtoe)</td>
<td>2020 (Mtoe)</td>
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### NEW BUILDINGS IN PERIOD 2008/2020

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<td></td>
<td>%</td>
<td>% Mtoe</td>
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<td>2020 (Mtoe)</td>
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<td>% Mtoe</td>
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<td>42</td>
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<td>42</td>
<td>50</td>
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### HYPOTHETICAL ACTIONS TO BE TAKEN PER GROUP

#### 1st GROUP
- **Improvements in Efficiency of existing equipment or replacement. Very little modification of envelope; except windows... very little contribution of new renewables (5 Mtoe<>2% of its energy consumption)**

#### 2nd GROUP
- **Not deep retrofitting, but improvements in the envelope, replacement of existing equipments and use of some new RES (12 Mtoe<>9% of its energy consumption)**

#### 3rd GROUP
- **Deep retrofitting with important improvements in the envelope, replacement of equipments and important new RES (16 Mtoe<>25% of its energy consumption)**

#### NEW BUILDINGS
- **Reduction in total energy consumption of 70% compared to conventional buildings and contribution of 9 Mtoe RES (50%)**
THE INTEGRATION OF COMMUNITY INSTRUMENTS. THE NEW TRENDS

Energy Policy:
To solve problems and needs of society

Research Policy:
Development of new technologies

Energy Policy:
To solve problems and needs of society

Research and Development
Demonstration
Market

DG TREN
DG RTD

FP7 ENERGY AND OTHERS
ENERGY EFFICIENCY
- ECOBUILDINGS
- CONCERTO
- POLYGENERATION

RES – electricity
RES – fuel production
RES – heating and cooling

Dissemination
IEE

Short term
Medium term
Long term

LEGISLATION
### POLITICAL AND LEGISLATIVE INSTRUMENTS

<table>
<thead>
<tr>
<th>Political and legislative instruments:</th>
<th>Sector</th>
<th>Supply</th>
<th>Demand</th>
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<tbody>
<tr>
<td></td>
<td>RES</td>
<td>EE</td>
<td>BU</td>
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<tr>
<td>White Book on RES</td>
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<td></td>
<td>X</td>
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<tr>
<td>White Book on Transport 2001</td>
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<tr>
<td>Action Plan on Energy Efficiency in Europe</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Directive on RES-electricity</td>
<td>X</td>
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<tr>
<td>Directive on Appliances</td>
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<td>Directive on Cogeneration</td>
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<tr>
<td>Directive on Bio-fuels</td>
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<tr>
<td>Directive on Energy Services</td>
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<td>X</td>
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<tr>
<td>Directive on Eco-design…</td>
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<td>X</td>
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<tr>
<td>Other: Lighting, Informatics…</td>
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</table>
### INTELLIGENT ENERGY.EUROPE 2

#### KEY ACTIONS

<table>
<thead>
<tr>
<th>Indicators:</th>
<th>Enable Policies</th>
<th>Transform Markets</th>
<th>Change Behaviour</th>
<th>Access Capital</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fields:</td>
<td></td>
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#### Integrated Initiatives

<table>
<thead>
<tr>
<th>Local Leadership</th>
<th>Special Initiatives</th>
<th>(from 2008 onwards)</th>
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<tbody>
<tr>
<td>Creation of local and regional energy agencies</td>
<td>Sustainable communities</td>
<td>Concerted Action buildings (CA EPBD II)</td>
</tr>
<tr>
<td>European networking for local action</td>
<td>Bio-business initiative</td>
<td>Market Replication Projects</td>
</tr>
<tr>
<td>Energy services initiative</td>
<td>Energy education initiative</td>
<td>Programme support</td>
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<tr>
<td>Intelligent energy education initiative</td>
<td>CHP initiative</td>
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</table>

#### SAVE

- **Energy-efficient buildings**
- Industry excellence in energy
- **Energy-efficient products**

#### ALTENER

- **Renewable electricity**
- **Renewable heating & cooling**
- **Domestic and other small-scale renewable applications**
- Biofuels

#### STEER

- **Energy-efficient transport**
- **Clean vehicles and alternative motor fuels**
- Strengthening of local players in the transport field (from 2008 onwards)
Innovative planning & architecture
Low-E materials and innovative components in construction
Integration of RES & EE technologies
Innovation in BMS including monitoring

**Level 1**
- Optimised operation
- Users influence
- Maintenance
- Energy Services

**Level 2**
- Education: professionals, users
- Planning of structures in relation to energy behaviour
- Benchmarking, Indicators
- Guidance for authorities
- Defining tariff structures

**Level 3**
- Optimal design of structures in relation to energy behaviour
- Benchmarking, Indicators
- Guidance for authorities
- Defining tariff structures

"ECO-BUILDINGS" Conceptual integration – Physical integration
“CONCERTO” (IN FP6)

ESCO

Big industry

Green electricity

Electricity

Natural Gas

Small industry SMEs

PV plant

Neighbourhood CHP

House with Solar thermal and PV

Storage

Local CHP plant

Wind power plant

Individual house

Office buildings
Eco-buildings

Energy consumption of **CONCERTO** ecobuildings:

- refurbished/retrofitted buildings lower National regulations for new buildings

- New buildings at least 30% lower than National regulations for new buildings
Renewable Energy Sources

Eligible Renewable energy sources are:

- wind energy
- solar energy
- hydroelectric power
- biomass energy
- landfill gas energy
- biogas and sewage treatment gas energy
- geothermal energy
- wave energy
- tidal energy

NEW installations substantial increase in the share of RES
1. Physical / Technical integration
   Production connected to consumption through a network and controlling mechanisms

2. Conceptual integration
   - RES and EE are combined in order to optimize the system’s performance
   - Green energy should not just replace conventional sources. This should be done in more EE systems.
ASSOCIATED COMMUNITIES

- Participate in the project
- Not receive EC support for demonstration actions
- Have a clear role in the project
- Are committed to develop their own local energy policies and plans
SOME RESULTS FROM CONCERTO

(APPROXIMATIVE)

- 45 CONCERTO Communities supported
- Equivalent population: 1000000 people
- Approximative extracost of the total communities: 650 M€
- Total energy reduction: higher than 30% compared to national regulations
- Total renewable energies contribution: 43% of the total final energy consumption
- Conventional energy consumption: 40% of the total energy consumption allowed by the national regulations
- Average direct payback: 4/5 years
- Average final payback: 6/7 years
1. The insufficient scale of the current effort
2. Transforming energy technology innovation: a European Strategic Energy Technology Plan (SET-Plan)
3. Process to arrive at the SET-Plan
4. Conclusions
PROCESS TO ARRIVE TO THE SET-PLAN

- Commission to adopt the first SET-Plan by the end of 2007 and put it forward to the 2008 Spring Council or even to the 2007 Autumn Council

- Two-stage consultation:
  - Until May 2007 – experts groups (ECTP was also consulted)
  - Until July 2007 – general public
CONCLUSIONS SET-Plan

- A new energy era.
- Energy technology has a **vital role** to play
- Adequate combination of innovation because ‘**business as usual’** is no longer an option
- **MS and industry** should at least match the increased budgets of FP7 and IEE in a very integrated way
- A shared and inclusive **European vision**, involving all relevant actors.
- SET Plan must be **ambitious** in setting targets, but **realistic** and pragmatic regarding resources.
- The SET-Plan will propose specific and concrete result-oriented initiatives
FINAL CONCLUSIONS
for the buildings construction sector

The challenges for the buildings sector are enormous !!!

- Only the adequate combination of permanent innovation (technological and non-technological) with powerful commercial action, in the framework of the existing legislation, will facilitate the achievement of these challenges

- The buildings contribution:
  - To be not only energy demanders but also suppliers
  - Buildings are a “natural place” for energy storage
  - Innovation in buildings means innovation in people’s quality of life

Sun/Earth: the miracle of the Universe; the buildings of the future: the intelligence of Man !!!