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The Societal Relevance of Sustainable Lifestyles – A Policy Perspective

Dr Pierre Dechamps

Adviser for Energy and Climate Change

BEPA - Bureau of European Policy Advisers to the President

European Commission

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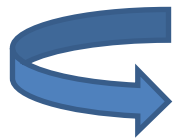
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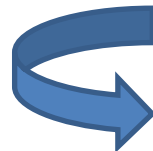
Challenges

- ❑ Fossil fuels provide an important portion of the world energy.
 - The full costs of our fossil fuel dependency is beginning to act as a drag on the world economy
- ❑ Dramatic rise in carbon dioxide emissions
 - climate changes will affect our societies, questioning issues of sustainability, distribution of power, migration and intergenerational equity



We are facing a:

- Global financial crisis
- Energy crisis
- Climate change crisis



Decarbonisation

A New Social Europe

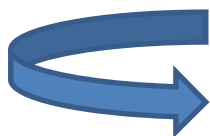


A Post-Carbon Society

European Energy Policy Framework

20 20 20 by 2020 policy challenge:

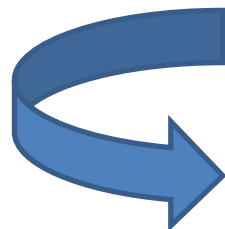
- reducing 20% of the EU Greenhouse Gas (GHG) Emissions
- Increase the energy efficiency by 20%
- increase the use of renewable energy by 20% and the use of 10% of renewable based fuels in transport.



Not enough to address the crisis of global warming and global peak oil and gas production.



Need for a global agreement – 50% by 2050



Industrial nations need to cut their emissions by 80 to 90% by 2050

New economic and social models
New energy paths



Society reorganization

International Climate Negotiations

Basic Principle: Common but differentiated responsibilities (from the Bali action plan)

from principle to practice, with the devil in the detail
we have seen the complexity of differentiating in the EU

Foundations: UNFCCC, and Kyoto Protocol (2 tracks)

we would wish to merge the two tracks
and have only one discussion

Chapters: mitigation, adaptation, technology and finance

diverse interests in diverse regions of the world
so must progress simultaneously
impossible to negotiate one chapter after another

International Climate Negotiations

Progress to date: slow, difficult

Other fora: G8, G20, MEF

there is a case to have talks in smaller groups
behind, is the broader issue of global governance in the 21st century

Issues: complexity, balance, diverse interests, right to development, historical responsibility, timing in the US, etc

worrying at this stage is the situation in the US

EU attitude: willing – leading – engaging – 20/20/20 – financing
communication – many many proposals and negotiation texts

but there is a limit to how much we can be an example for the rest
of the world if the rest of the world does not follow.

From 2020 to 2050 – *Lost in Transition?*

Objectives for 2020 are clear (at least for the EU internally) and will be achieved by **evolution** (a few more windmills, PV, energy efficiency, etc)

Objectives for 2050 are spelt out clearly as well (-50% CO2 worldwide, that is -80%+ in developed economies)

But they require a **revolution** – a completely different society (transport, housing, heating, etc) with changes in behaviour

And we make decisions now with an impact on 2050 emissions (power plants, housing, etc)

what path will take us there ?

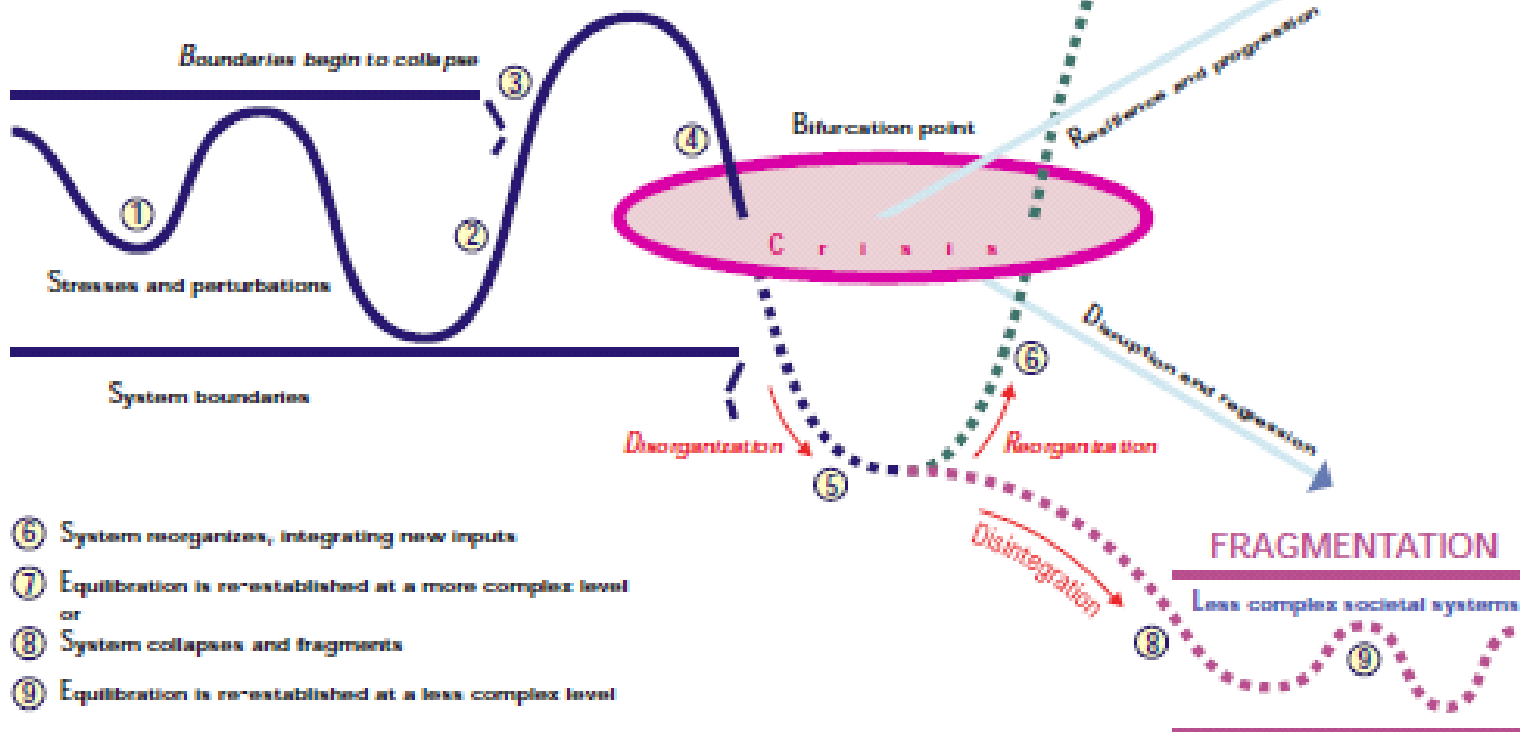
what technologies (if any) do we want to push ?

do we try to pick winners ?

will market forces (incl. a carbon price) push us in the right direction?

System Transformation Theory

- ① System in dynamic equilibrium
- ② Changing inputs increase perturbations
- ③ Boundaries begin to collapse
- ④ System goes into crisis
- ⑤ Increasing disorganization



- ⑥ System reorganizes, integrating new inputs
- ⑦ Equilibration is re-established at a more complex level or
- ⑧ System collapses and fragments
- ⑨ Equilibration is re-established at a less complex level

A Post-Carbon Society

A post carbon society makes possible to reframe the energy and climate change challenges as opportunities, not just to foster a wealthier society, but also a more equitable and sustainable one.

Four (possible) pillars of a Post Carbon Society:

- Renewable Energy
- Buildings, and the built environment
- Energy Storage
- Smart grids and Plug-in Vehicles

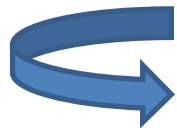
First Pillar: Renewable Energy

Renewable energy have a crucial role in a post carbon society.

Renewable energy - solar, wind, hydro, geothermal, ocean waves, and biomass represents, now, a small percentage of the global energy mix, they are growing rapidly and their falling costs make them increasingly competitive.

The EU has set in motion the process of vastly enlarging the renewable energy portion of its energy mix, when established a target of 20% of renewable energy.

It is expected that renewable energy will provide nearly half of the primary energy, and about 70% of the electricity produced within the EU, by 2050.



Contributing to the creation of million new jobs.

Second Pillar: Buildings and the built environment

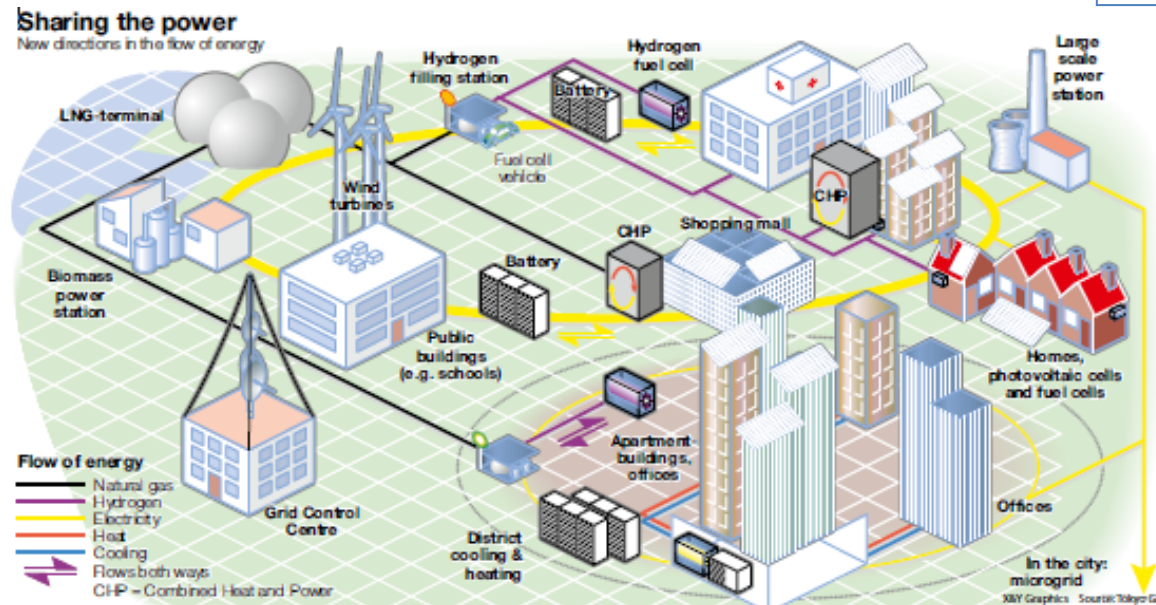
- ❑ Buildings consume about 30 to 40% of all the energy produced.
- ❑ Represent the major contributor to human induced global warming.



Design and construct buildings able to produce their own energy from RES.



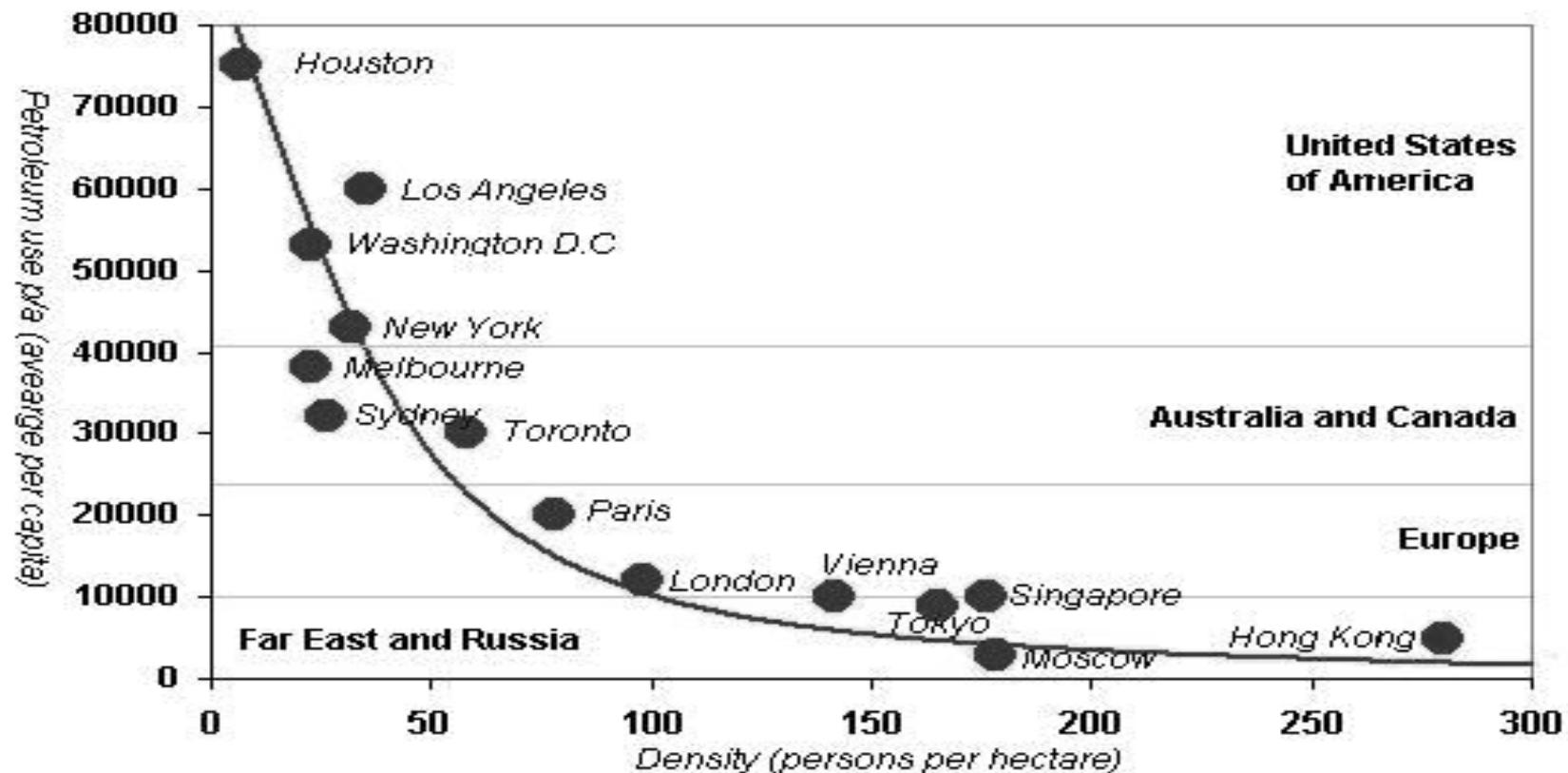
Buildings as Power Plants



Second Pillar: Buildings and the built environment

Relationship between Transport and Land Use

A commonly used study of 32 cities by Newman & Kenworthy in 1989 concluded that there was a strong link between urban development densities and petroleum consumption.



Annual petroleum use per capita adjusted to US MJ (1980)

After Andrew Wright Associates, small section taken from 'Towards an Urban Renaissance', Urban Task Force Partnership, 1999, (c) DETR, 1999.

WikiUser:DrRobinson -
Under GFDL

Third Pillar: Energy Storage

Renewable Energy

Buildings as Power Plants

Maximize RES
Minimize costs



Energy storage



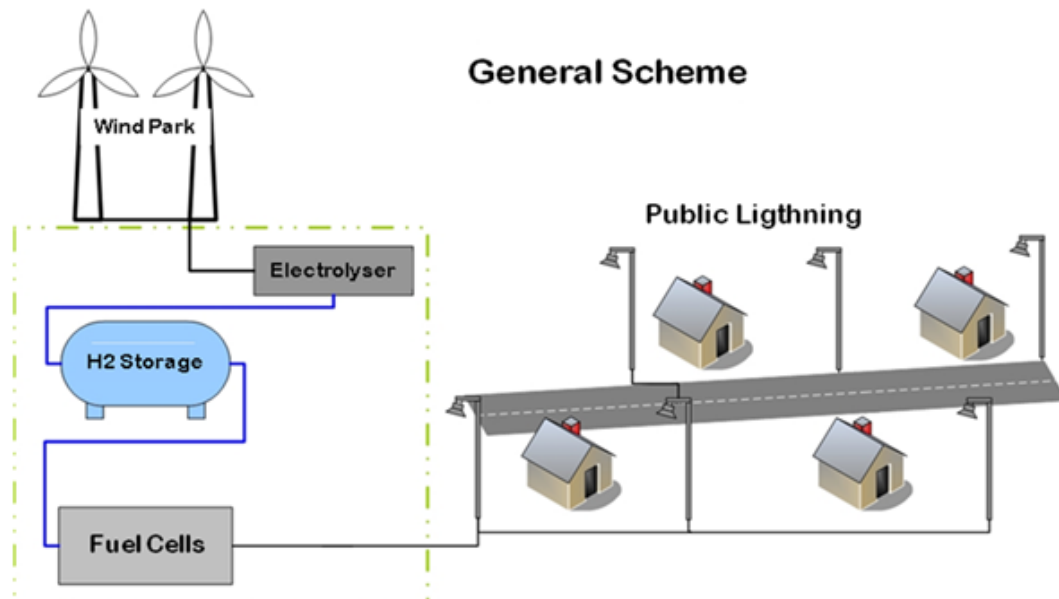
Facilitate the conversion of intermittent supplies of RES into reliable assets.

batteries, water pumping, hydrogen, flywheels, etc

Third Pillar: Energy Storage

The European Commission announced, in October 2007, an ambitious public-private partnership to speed the commercial introduction of a hydrogen economy in the 27 member states, with the focus on producing hydrogen from renewable sources of energy.

Hydrogen from RES – Demonstration project in the island of Porto Santo (Madeira, Portugal)



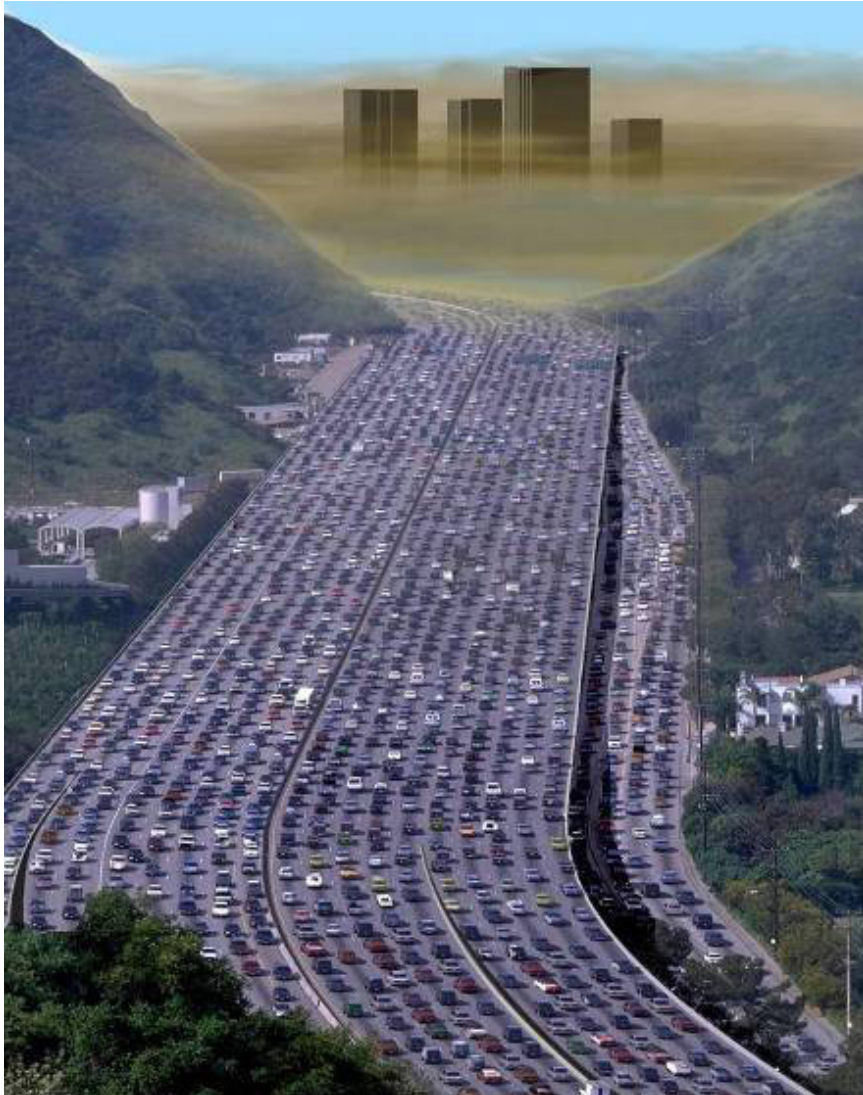
Fourth Pillar: Smart Grids and plug-in vehicles

Reconfiguration of the power grid in order to allow that businesses and homeowners produce their own energy and share it with each others, as well as information.

- ❑ **Minigrids** – allow homeowners and companies to produce locally energy using RES and use it off-grid for their own needs.
- ❑ **Smart Metering technologies** - allow local producers to more efficiently sell their energy to the main grid, as well as accept electricity from the grid, making the flow bidirectional.
- ❑ **Sensing devices and chips** – The introduction of this devices in the system connecting all the electrical devices allows to know, at any time, the quantity of energy used.

The interconnectivity can be used to redirect energy uses and flows during peaks, and even to adjust to the price changes of electricity from moment to moment.

Fourth Pillar: Smart Grids and plug-in vehicles



For transport, although advanced technology measures (vehicles and fuels) will be important, their impact alone is neither big enough nor soon enough

Additional measures including behaviour and lifestyle changes will be inevitable

Profound impact on future mobility

Courtesy: transfuture.net

Fourth Pillar: Smart Grids and plug-in vehicles

The intergrid makes possible a broad redistribution of power. Centralized, top-down flow of energy becomes increasingly obsolete. In the new era, businesses, municipalities and homeowners become producers as well as consumers of energy.

Plug-in Vehicles

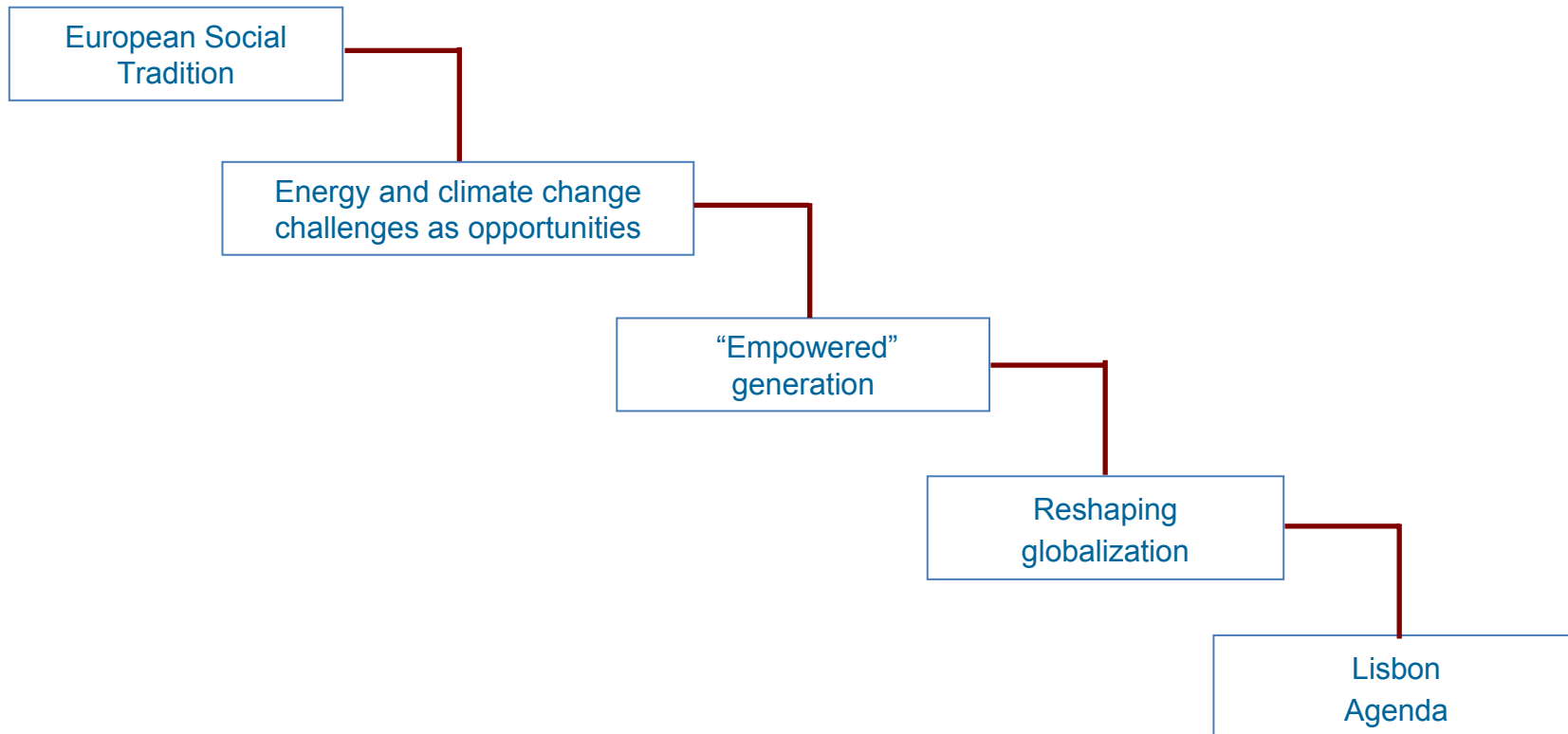
- Electric and hydrogen- powered fuel cell plug-in vehicles will be “power stations on wheels” with a generating capacity of twenty or more kilowatts.
- Since vehicles are parked much of the time they can be plugged during non-use hours.
- Electric and fuel cell plug-in vehicles become a way to store massive amounts of renewable energy.

Social Impact of a Decarbonised Society

Need of a **New Social Europe** in the 21 st Century



Reframe the energy and climate change challenges as economic opportunities, in order to foster a wealthier and a more equitable and sustainable society.



Social Impact of a Decarbonised Society

New Social Europe in the 21 st Century

European Social Tradition

- Key principles - Promote individual freedom and social responsibility - market initiatives and social models in order to ensure economic growth, broad access, social cohesion and solidarity.
- A new social Europe emphasizes not only individual opportunities but also the society life quality.
- The democratization of energy becomes a rallying point of social Europe.

Energy and climate change challenges as opportunities

- Reduction of the dependence on fossil fuels and control of the energy driven inflation, represent the first step to preserve equity in the distribution of wealth.

“Empowered” generation

- Distributed energy generation - Business, municipalities and homeowners as producers and consumers of their own energy. **Distributed energy means distributed wealth.**
- A post carbon society can pave the way to a New Social Europe where power is broadly distributed encouraging new levels of collaboration among its citizens.

Social Impact of a Decarbonised society

New Social Europe in the 21 st Century

“Empowered” generation

- Decentralized energy means decentralized power.
- Empowerment of people.
- From a centralized bureaucratic society to a decentralized flexible society

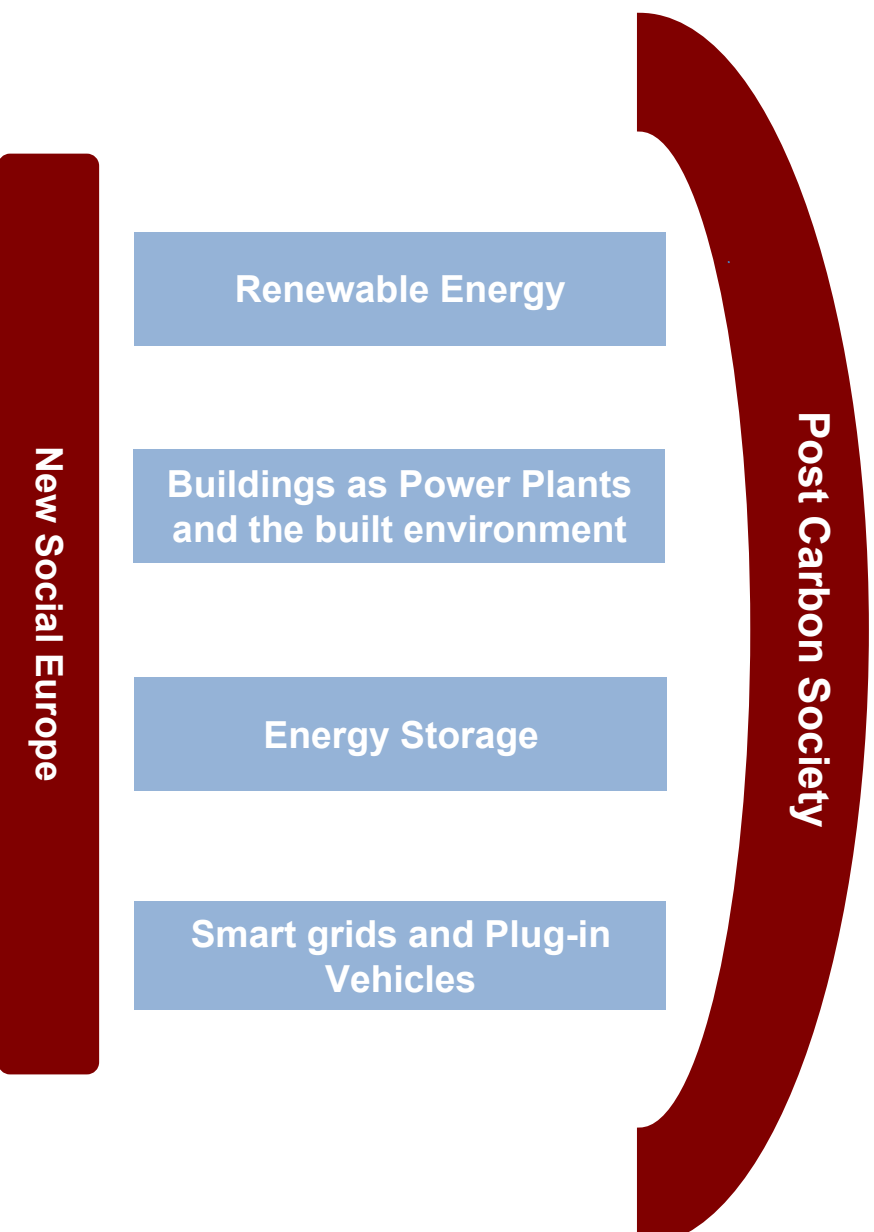
Reshaping globalization

- A post carbon society will allow for a broader involvement of countries that have traditionally been energy importers (example of biofuels).
- The new energy paradigm has important implications in the distribution of power outside Europe - **changes in the globalization process.**

Lisbon Agenda

- **Knowledge** will be key in fostering the Post carbon society and ensuring a smooth social transition.
- The Post carbon society will require innovative educational reforms focused on advanced information, bio and nano technologies, the earth sciences, ecology, systems theory, collaborative and distributive education, open-source learning models, and social capital.

Conclusions



Conclusions

New Social Europe

Wealthier

Equitable

Sustainable

European Social Tradition

Energy and climate change challenges as opportunities

“Empowered” generation

Reshaping globalization

Knowledge, Education and Innovation (Lisbon Agenda)