

*Conferenza su politiche energetiche e cambiamenti climatici.*

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**MAKE MORE FROM LESS**  
**Experiences from technical innovation and energy efficiency**

*Intervention of:*

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Europe and the other industrialized countries faced a long period of a constantly and fast growing economy. But now we are recognizing several problems evolving. First of all, it becomes obvious that there are not enough resources available on earth to provide such a way of life to 6 or 8 billion people. Rising prices for energy, steel, wood and many other materials are a clear indicator. Also the resource "environment" is limited. Atmosphere is not able to take up all the CO<sub>2</sub> emissions from our consumption of fossil fuels. They aggregate and change the global energy balance in a way that affects humankind negatively.

On the other hand, even in our countries, people don't feel more comfortable now, that they felt 20 years ago at a much lower level of GDP. More cars, larger flats, longer journeys during the holidays and many other things mainly caused increasing resource consumption and not so much an increase in well-being. Although economy is growing, there are not more jobs and there is no growing income. The unpleasant dependency on states with unstable regimes should not be discussed here, but cannot be disregarded.

It is obvious that this development should not be prolonged. To overcome this situation, radical changes are necessary. Continuous improvements and slight changes will not be able to help out of the situation. The final goal has to be a production and consumption system, where there are no wastes and emissions – a bio-based Zero-Emissions system like nature.

One of the important aspects is the service efficiency. That means that the material and energy input per service provided has to decrease dramatically. Energy and material consumption should not further grow with the amount of services (mobility, nutrition, housing,...) but has to go down.

So some of the basic questions for society in future are:

- How can economic growth and environmental impact be de-coupled?
- How can production and consumption be de-linked from resource throughput?
- At which material and energy input is the maximum of well being

The approaches are manifold and cover the use of so far unused resources, efficiency measures but might also ask for more sufficiency.

Many examples of successful developments show that most services can be delivered more effectively with a reduced input. Industry can manufacture goods with much less water and energy. Passive houses – houses that need almost no fuels in any climate - provide a higher comfort and a better indoor air quality at practically the same costs. Solar energy for the generation of warm water in households and industry is not only more environmentally friendly, but is also a big source for new jobs. Alternative energies like biogas, biomass heating systems, wind energy and bio diesel are technologies with highest growth rates, much higher than telecommunication or nanotechnology.

The emerging technologies for a bio-based economy have the potential for providing clean solutions for a number of materials needed, generating jobs on the countryside at the same time.

The oil-age started about 100 years ago, and had high growth rates over about 60 years. Now we expect that the fossil-based economy is facing its end. This is not only a question of diminishing resources, but new and better technologies are emerging and will replace the existing ones.