Demand Side Management (DSM)

A renewed tool for sustainable development

A survey of the concept, development and application

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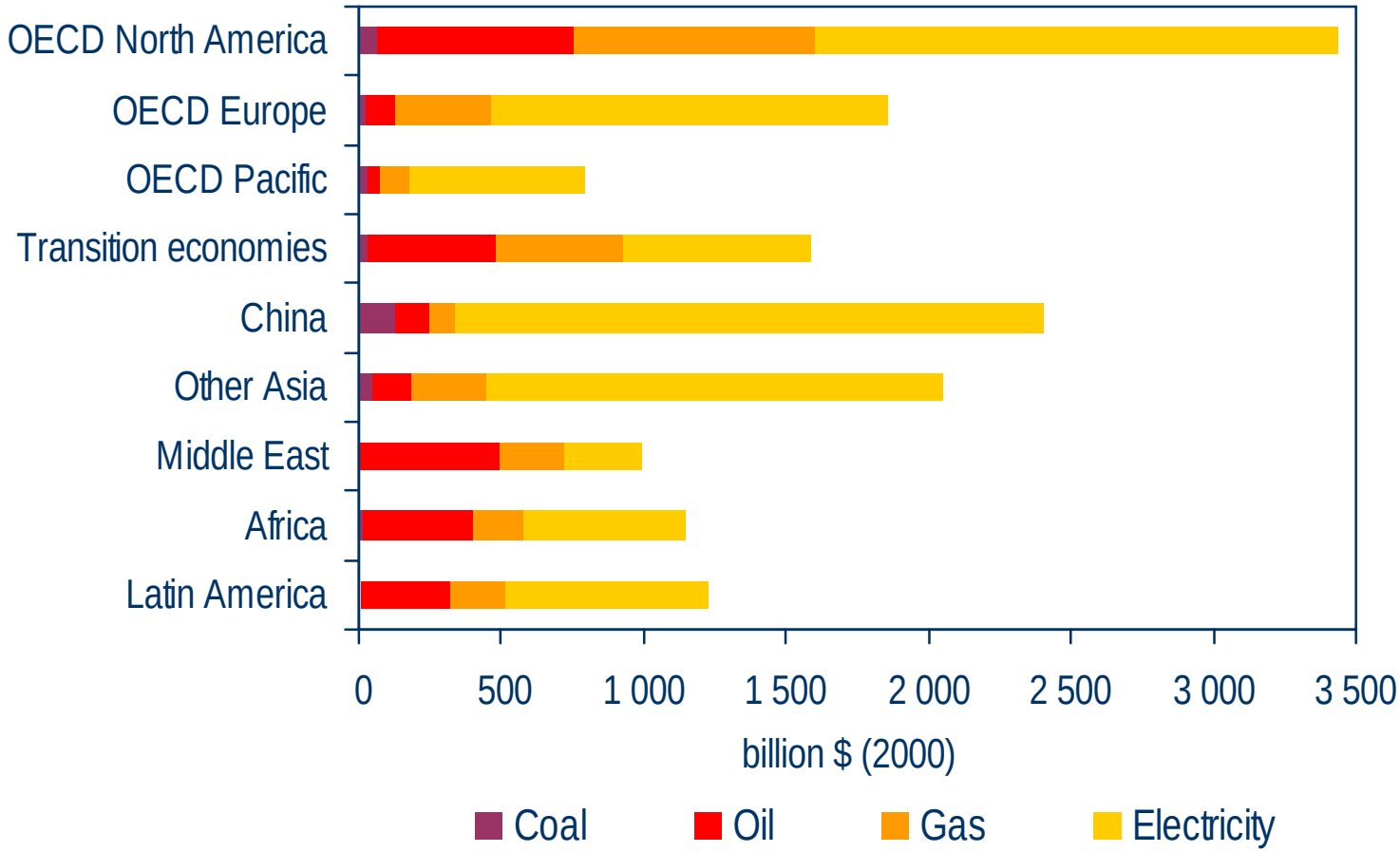
DSM is universal and does not only apply to utilities, electricity or monopolies!!

*"The planning and implementation of those (**utility**) activities designed to influence the customer use of **electricity /energy** in ways that will produce desired changes in the (**utilitiy´s**) load shape - i.e. changes in the pattern and magnitude of a (**utility´s**) load."*

The problem is not one but several!

- **LOAD LEVEL** (Too much supply for a wasteful demand)
- **LOAD SHAPE** (high peaks, little reserve capacity, bottlenecks in transmission and distribution)
- **MARKET RESPONSIBILITIES** (who is the owner of the problem?)

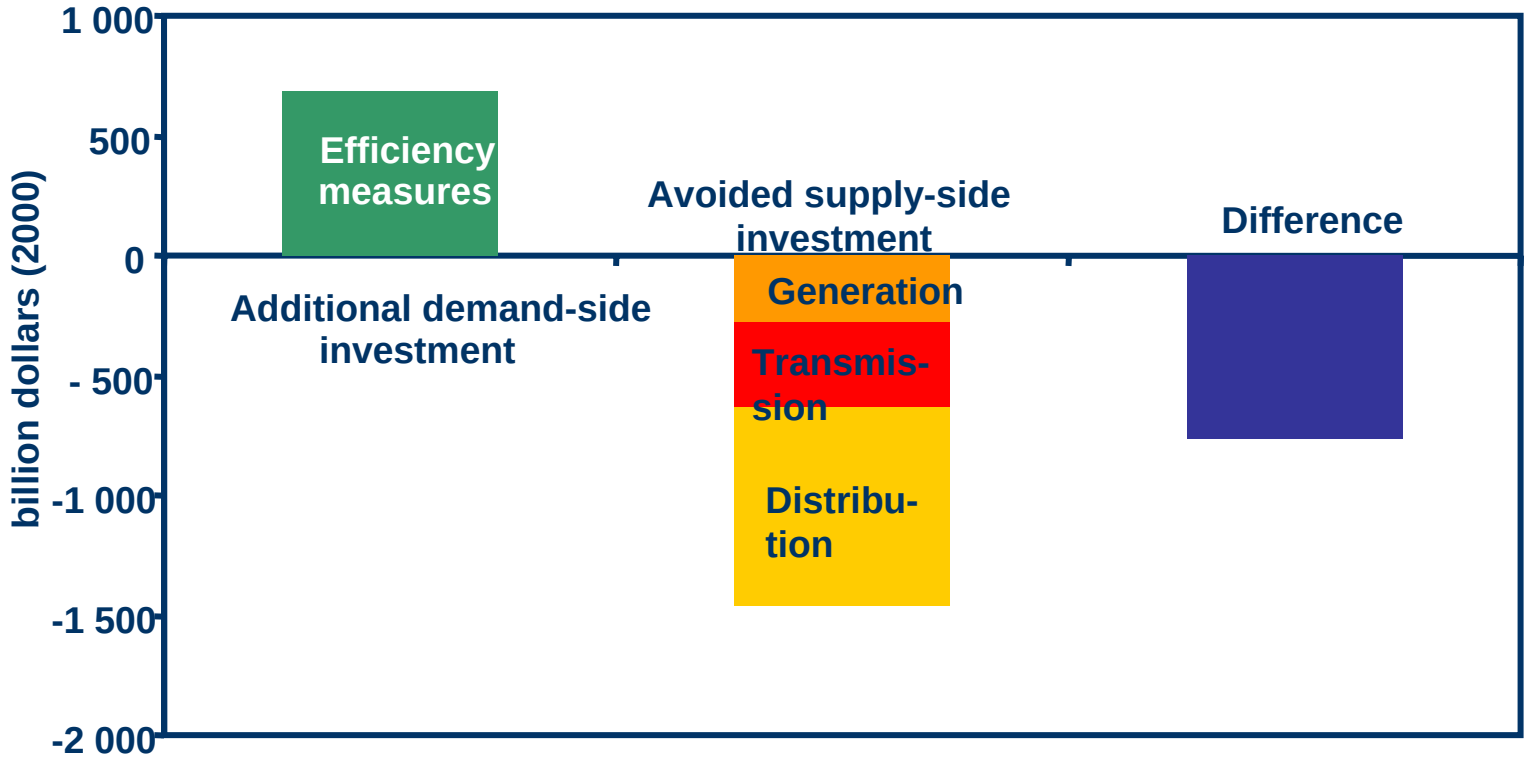
Cumulative Energy Investment 2003-2030
Sixteen (16) Trillions USD!!



Power sector absorbs 62% of global energy investment in the period 2003-2030

Source WEO 2004

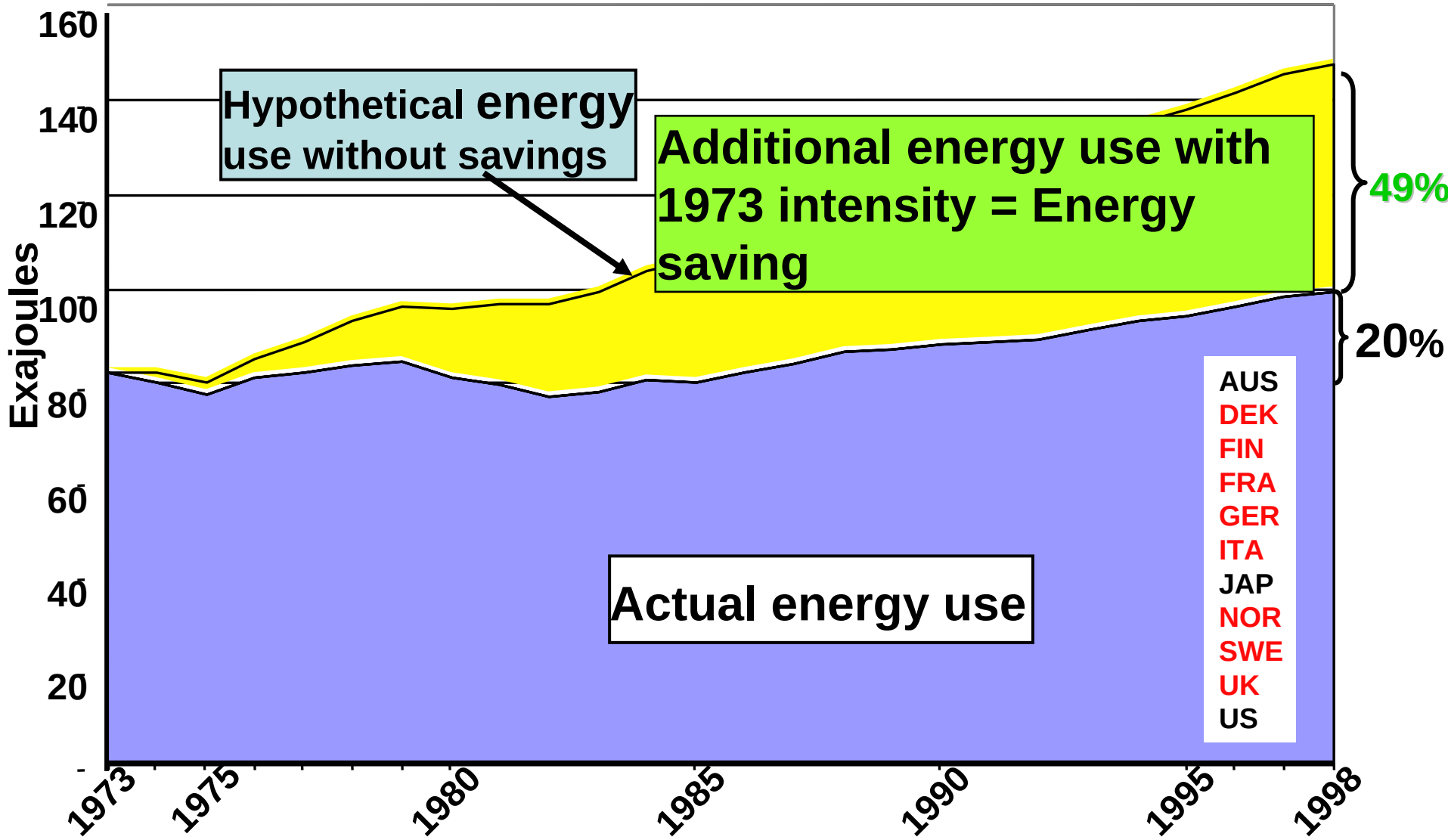
Difference in Electricity Investment in the Alternative vs. Reference Scenario 2003-2030



Additional investments on the demand side are more than offset by lower investment on the supply side

Source WEO 2004

Energy-use in the IEA-11



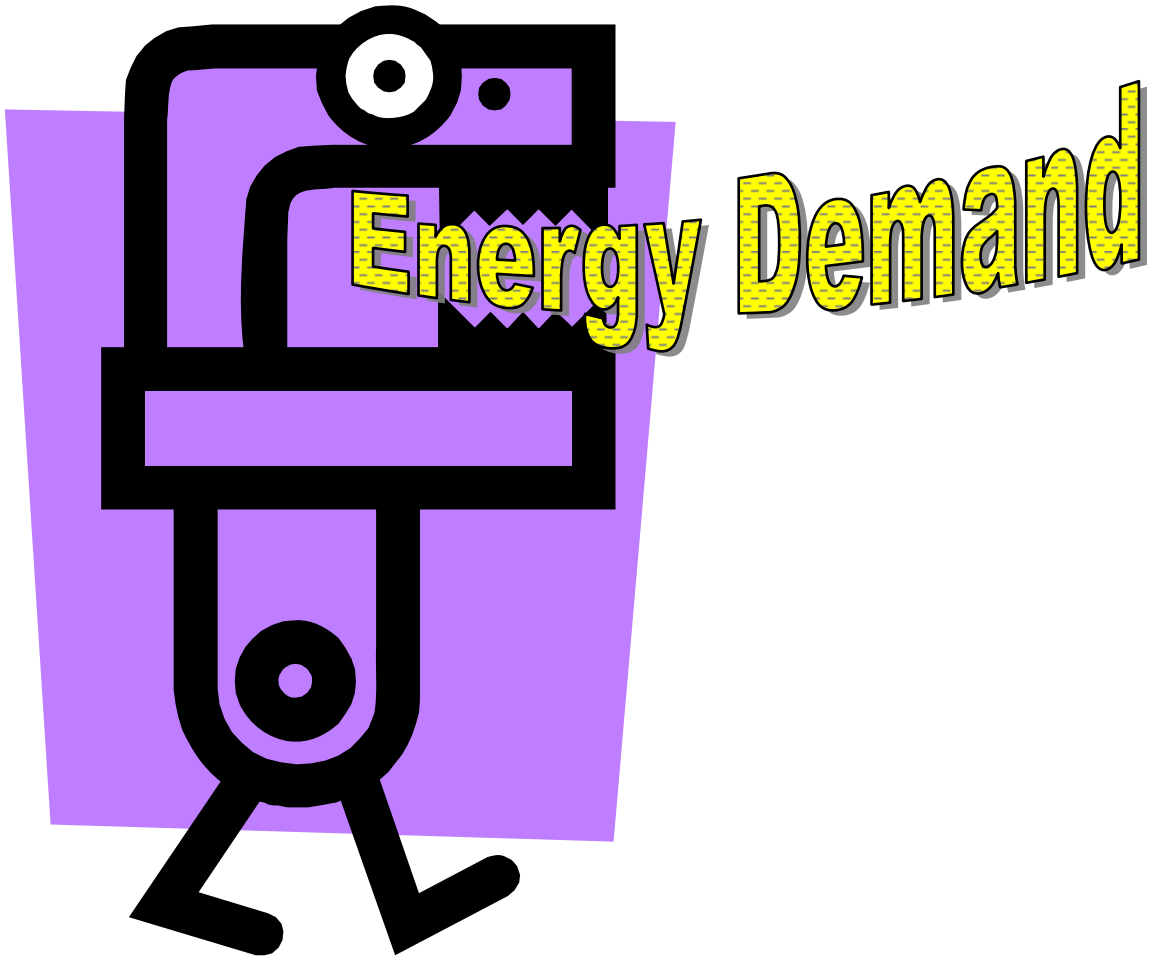
Source: 30 years of energy use in IEA countries

The rise in welfare depends more on energy efficiency improvements than on growth in energy use!

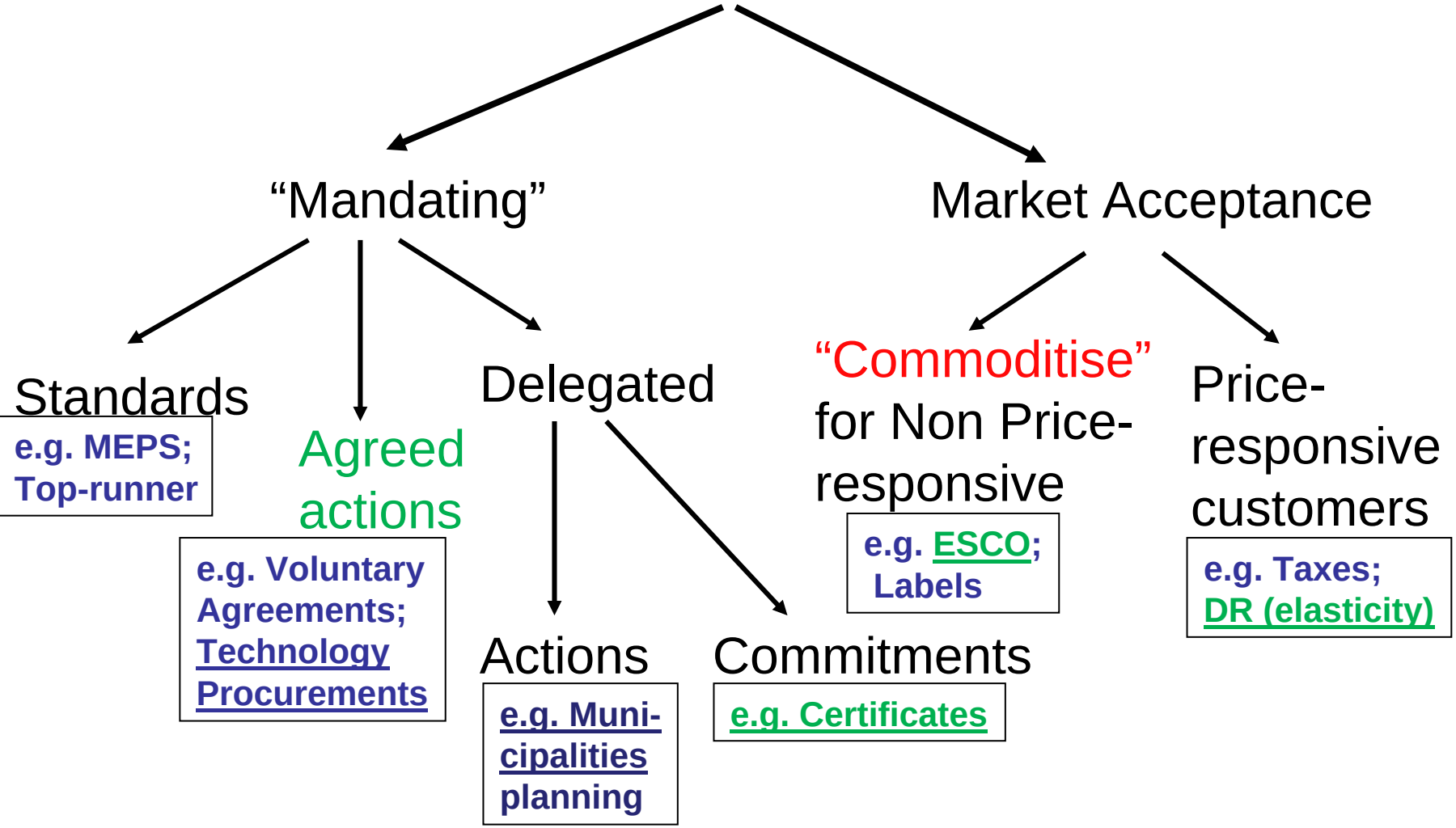
Energy Efficiency has multiple dividends

- **Cost**
- **Environment/Climate**
- Employment
- Industrial development
- Poverty alleviation
- Holds back prices in supply
- Reduces pressure on supply reserves

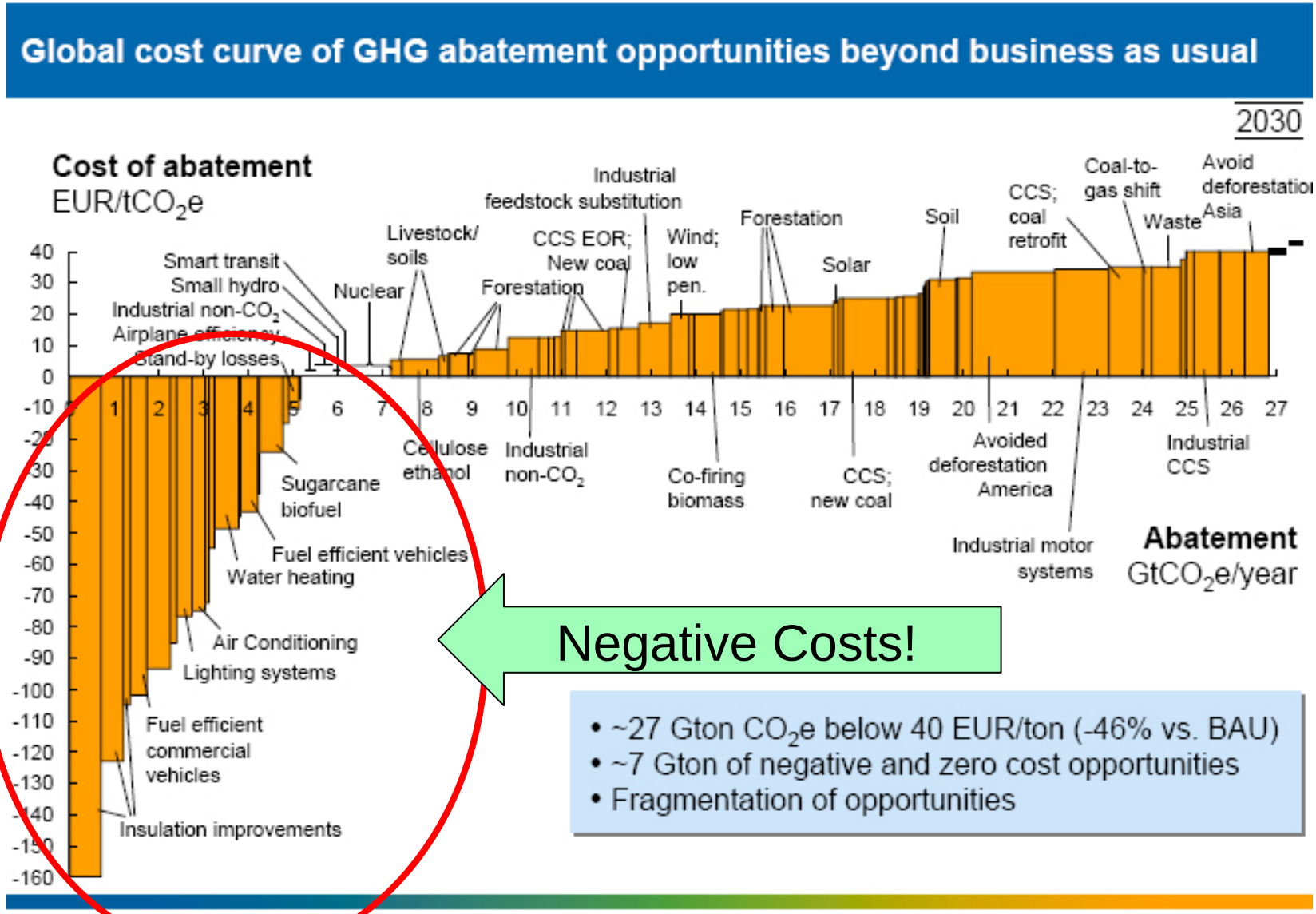
DSM is a tool to make large scale energy efficiency possible



LARGE-SCALE ENERGY EFFICIENCY



Energy Efficiency is the cheapest resource

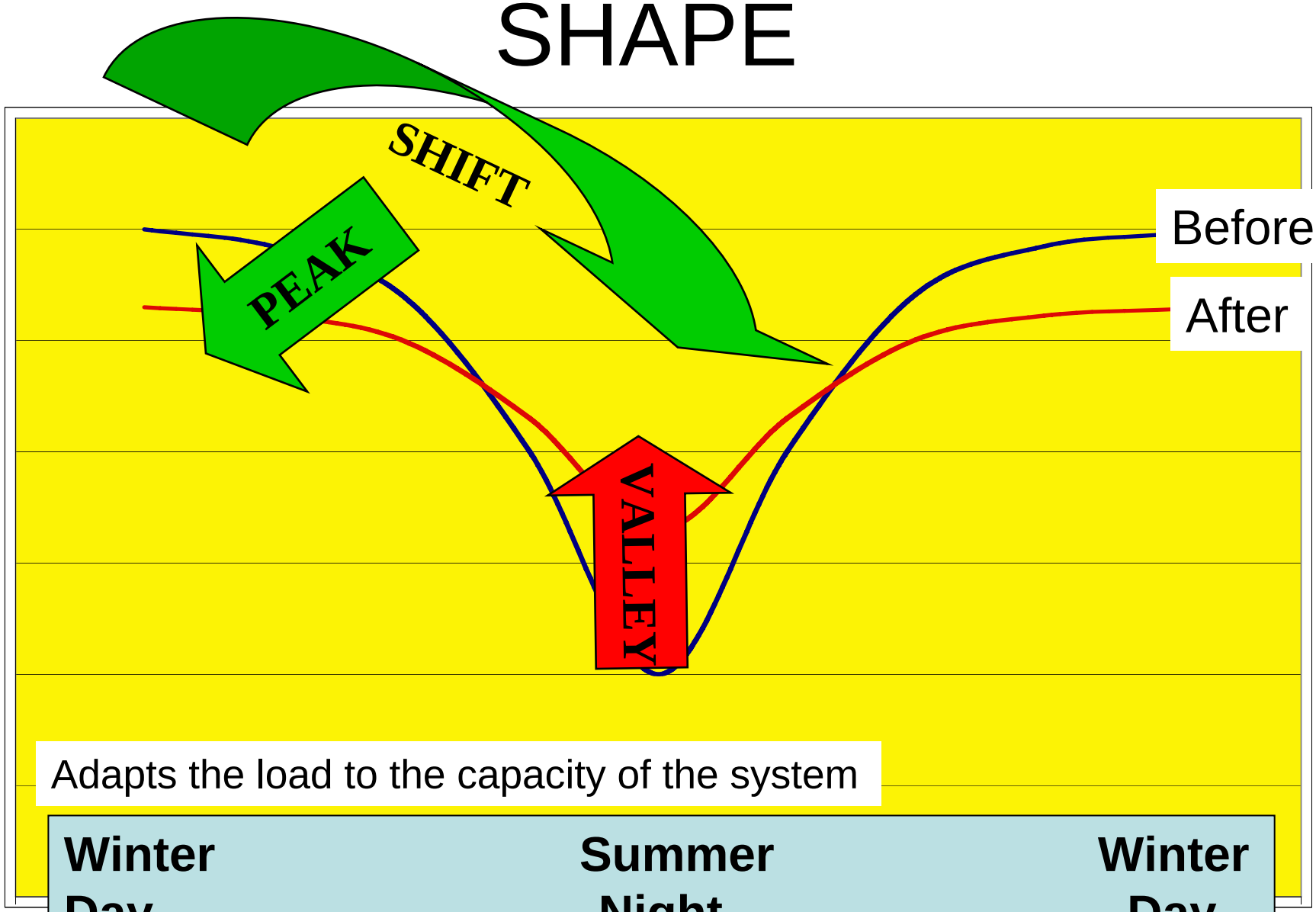


DSM nowadays

- Is more complex and more comprehensive
- Involves more stakeholders
- Gives more opportunities with new technologies

The Mechanics of DSM

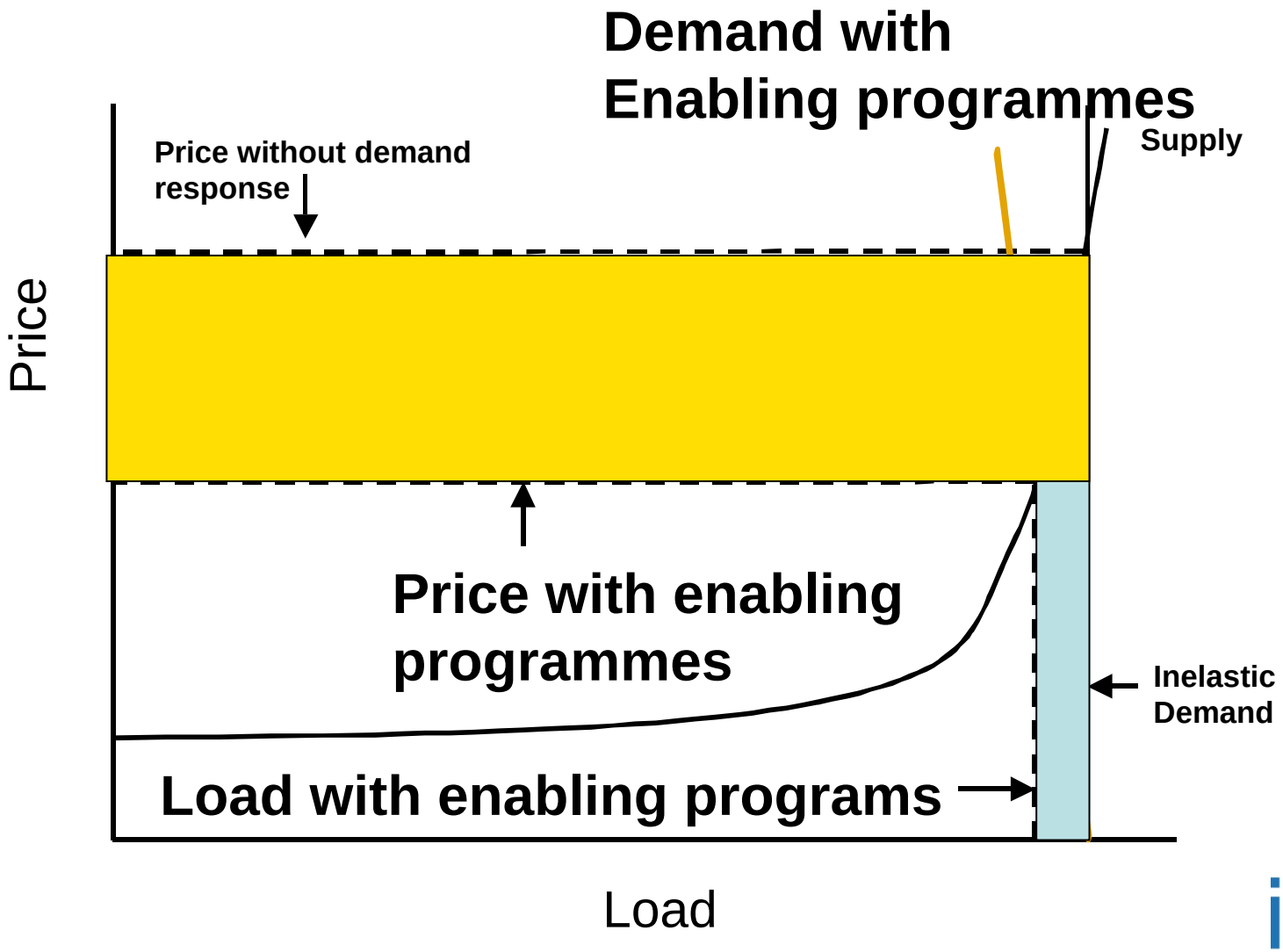
DSM can Change the LOAD SHAPE



Adapts the load to the capacity of the system

Winter Day	Summer Night	Winter Day

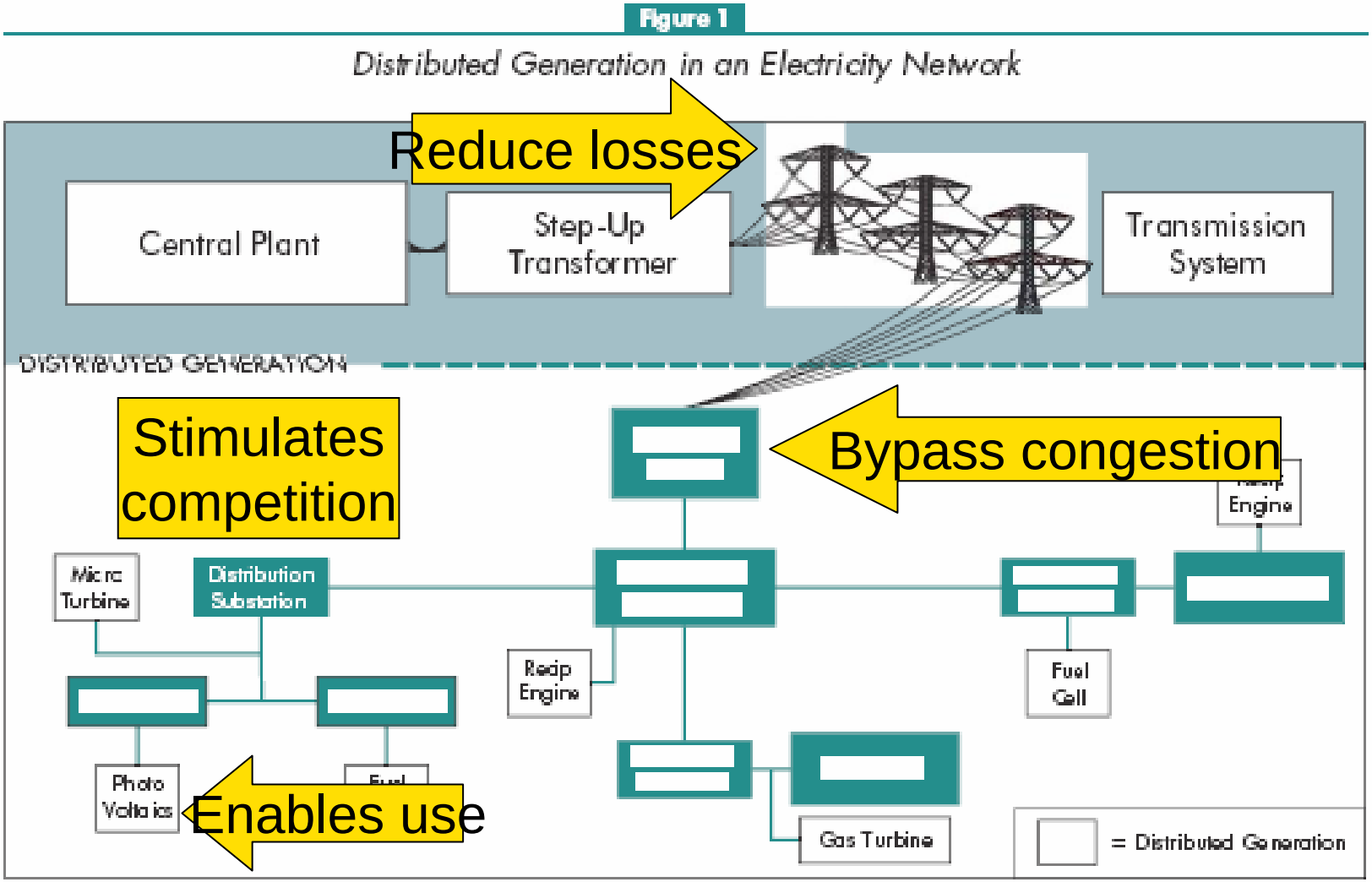
DR and price volatility



Load Shape Technology

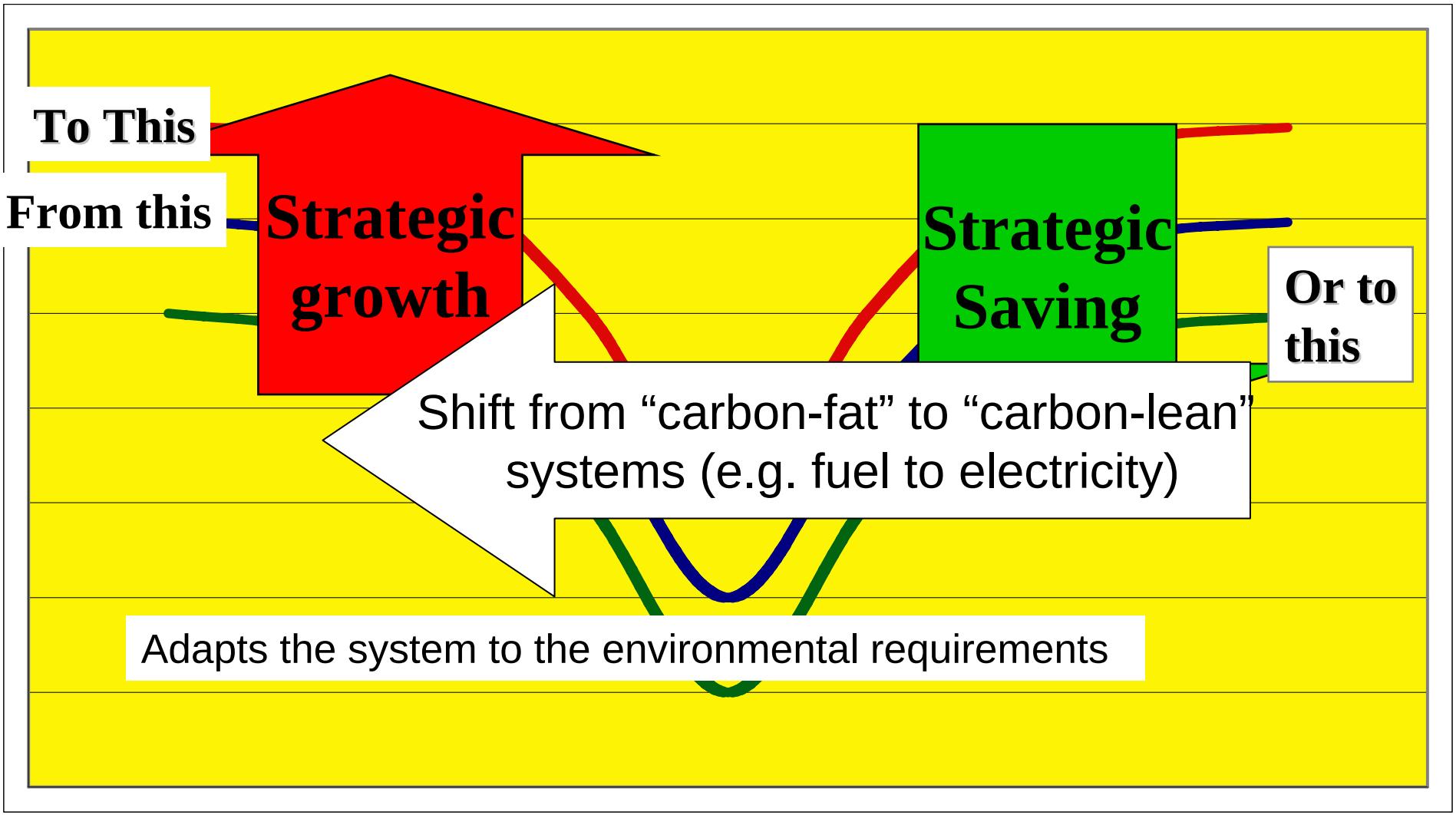
- Meters …….BUT ALSO…
- Communications ……..AND
- Software for calculation, billing, verification, settlement ……AND
- Pricing structure……AND
- Institutional models……..AND
- End use capacity to accommodate (e.g. Storages)

New paradigms – Distributed Generation

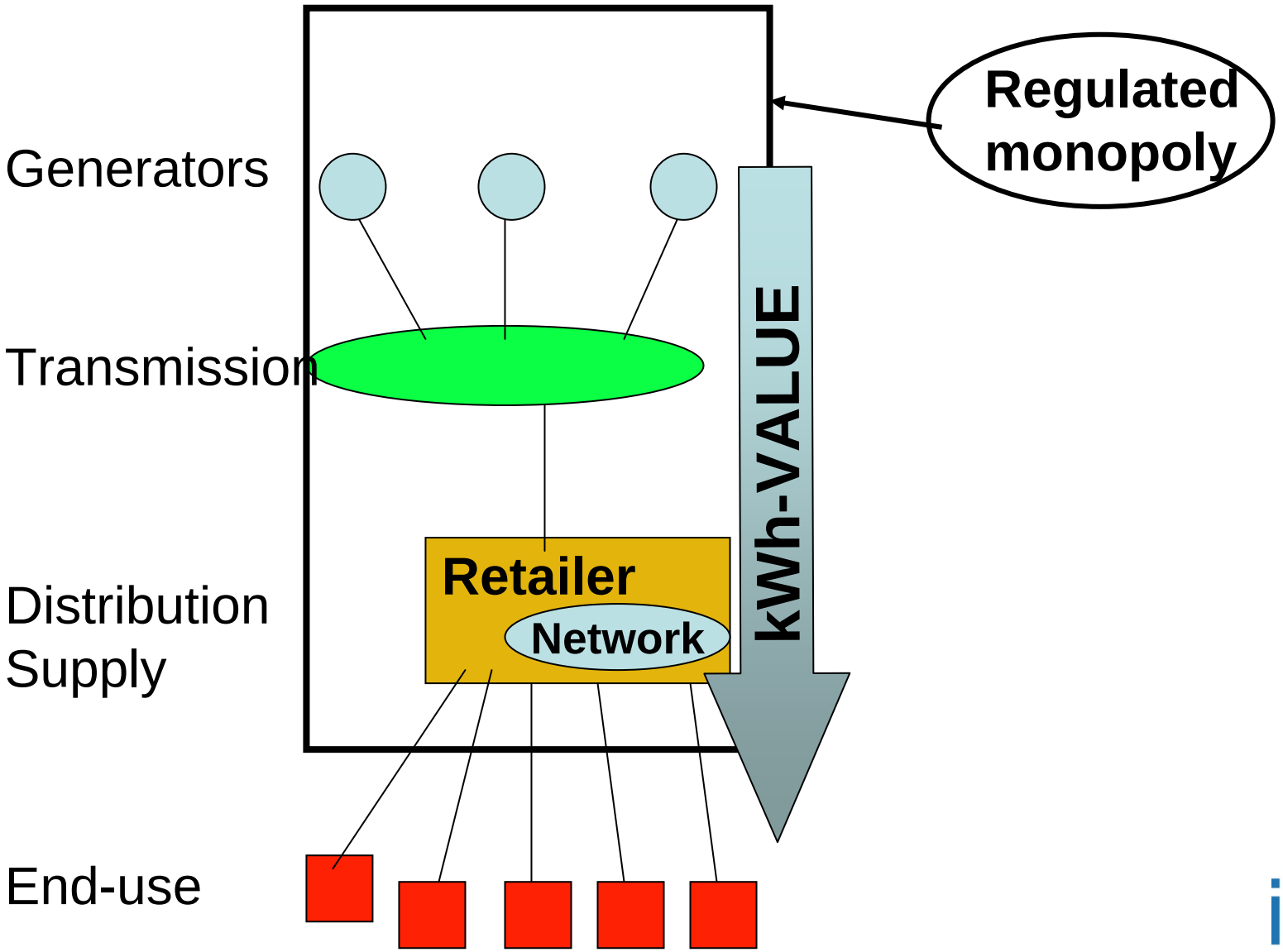


Source: Distributed Generation In Liberalised Electricity Markets. OECD/IEA 2002

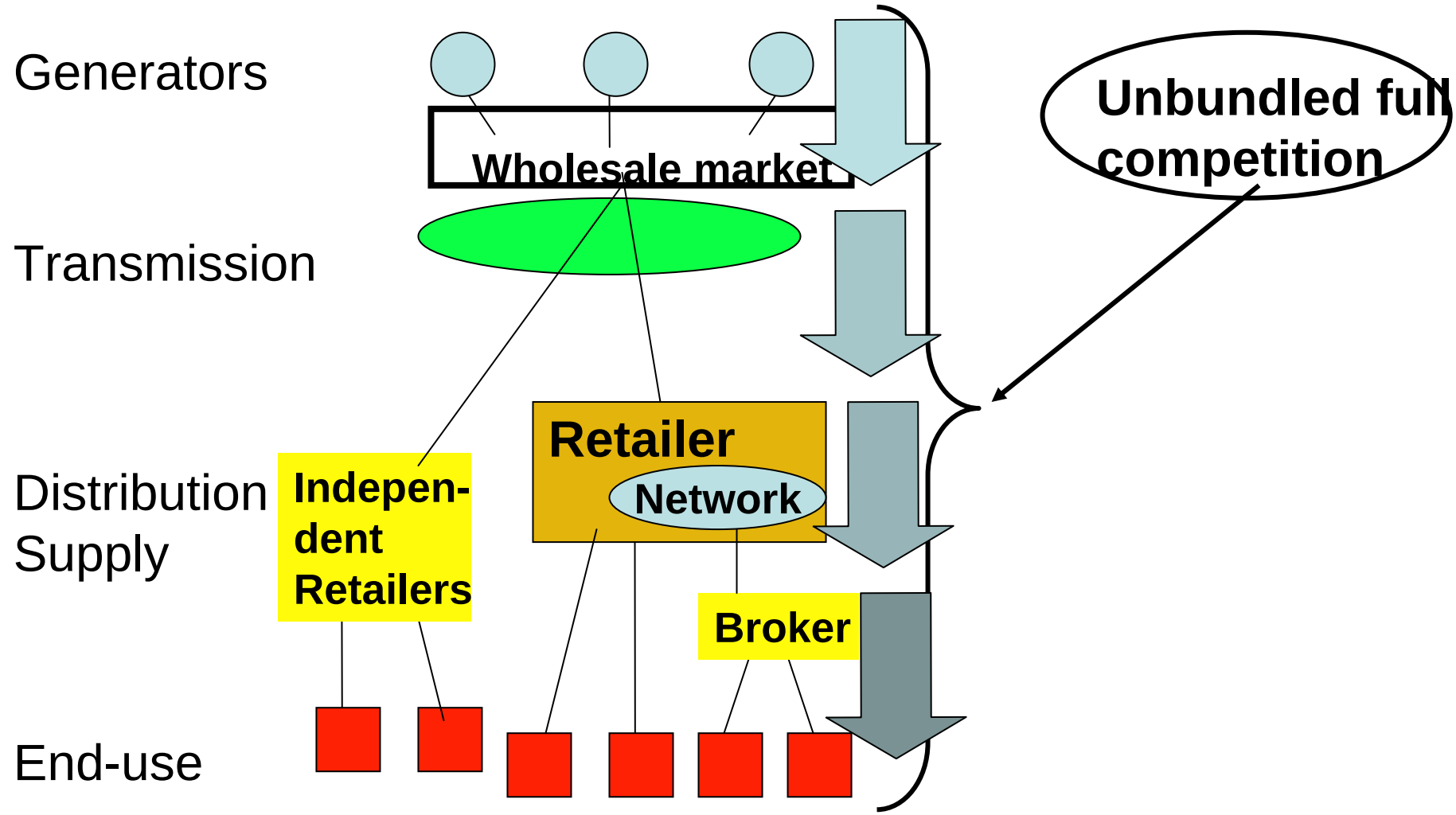
DSM can change the LOAD LEVEL



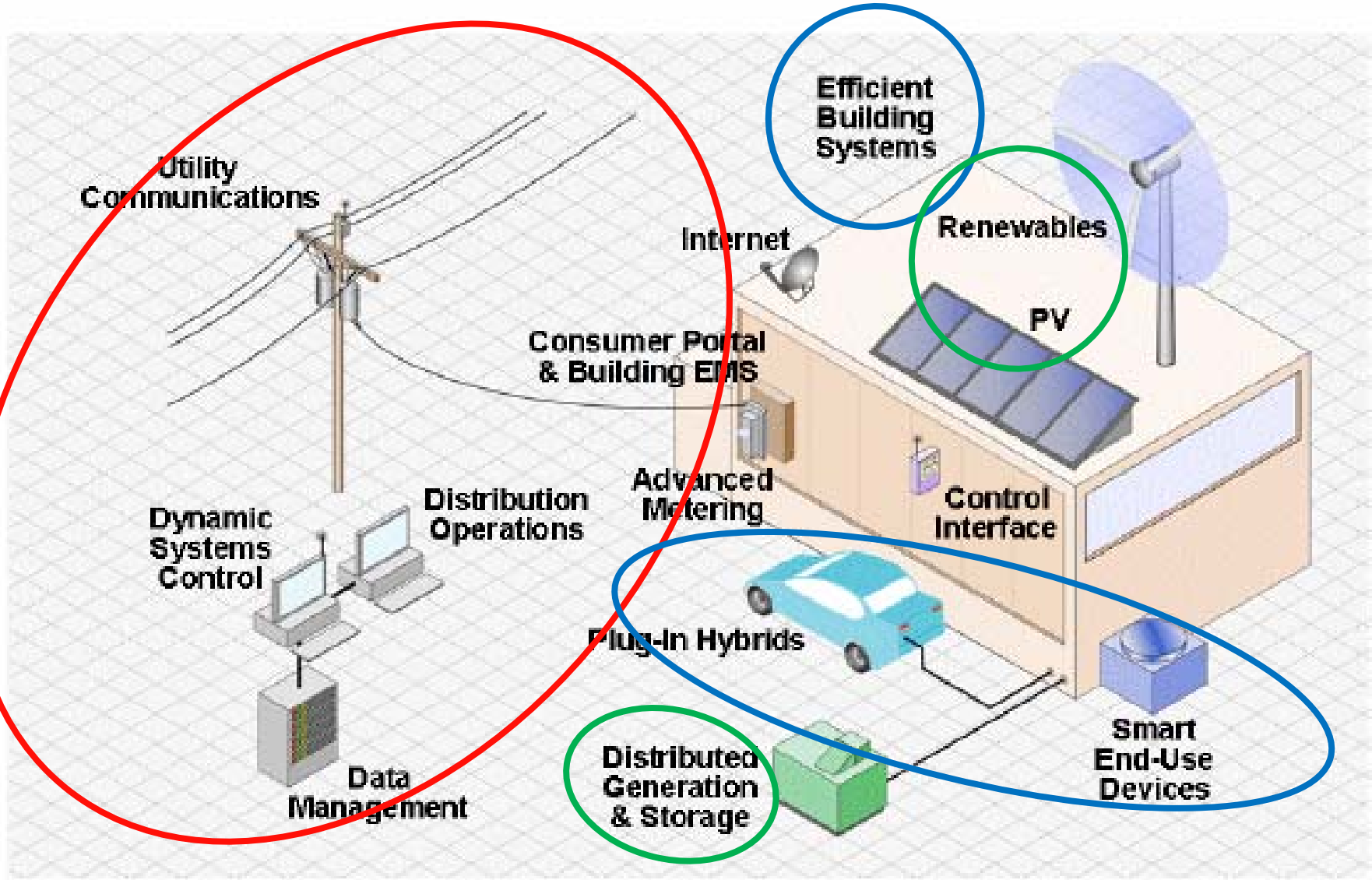
The value chain used to be vertical..



…but with liberalisation the value chain is fragmented



New Technologies

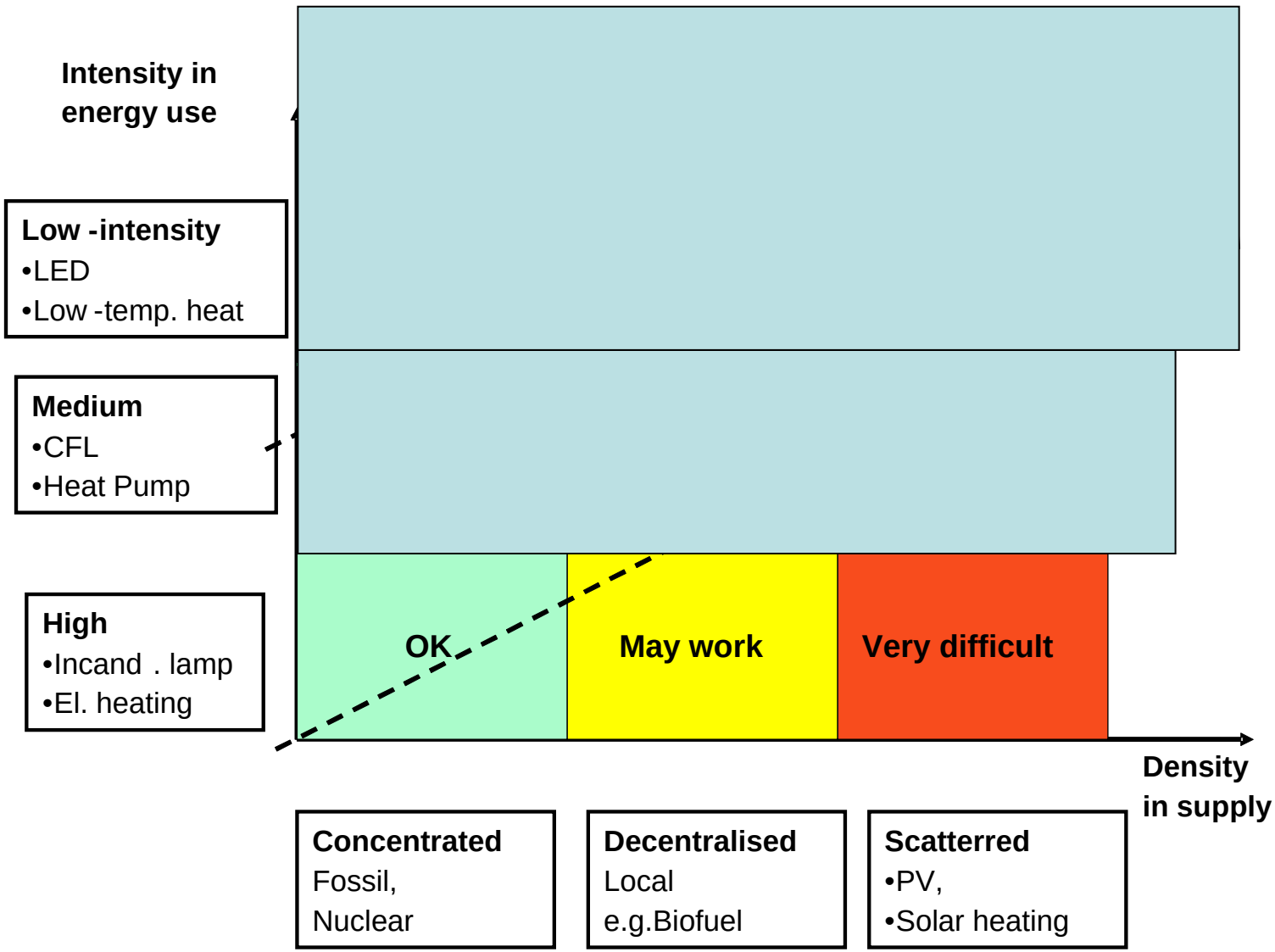


Source: An EPRI Initiative to Advance the Efficient and Effective Use of Energy

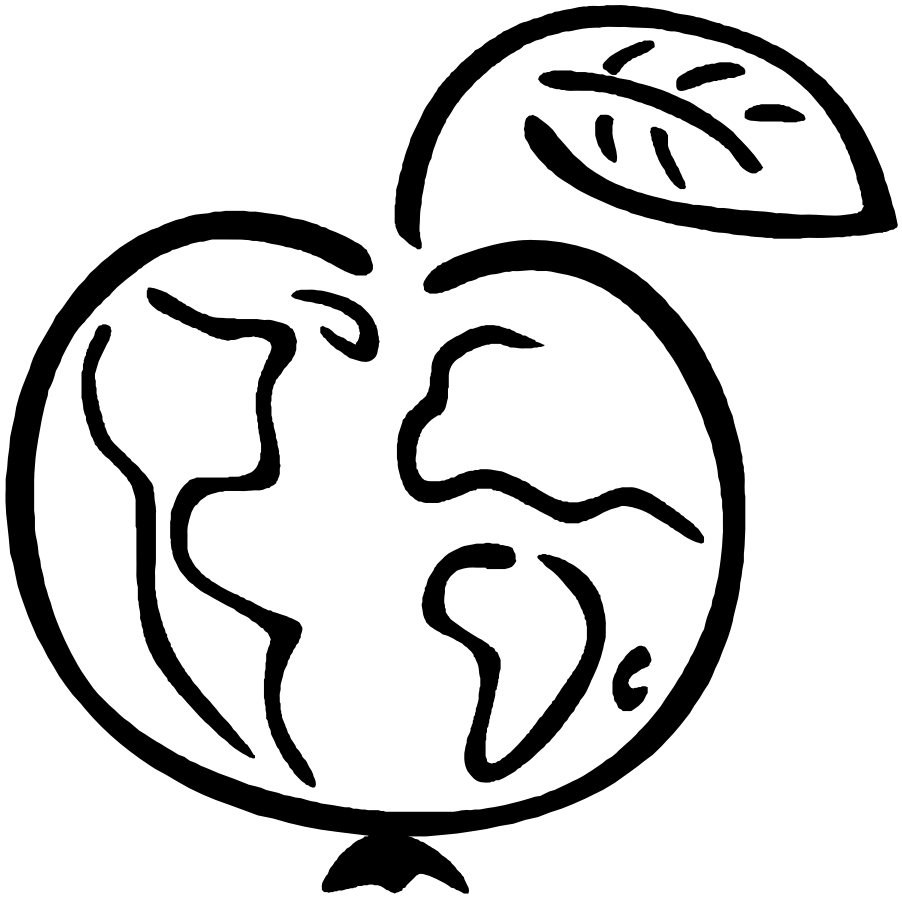
Business interest in DSM

Actor	Peak Load	Load Level	Remark
Generation company	**No** (prices are set on the margin)	**No** (loss of sales)	Windfall profit may be regarded to be too high by authorities
Systems responsible (regulator)	**Yes** (to avoid systems break-down)	**Possibly regional and in special situations** (to avoid bottlenecks and to maintain systems to develop as planned)	Very different organisation between countries.
Transmission and Distribution	**Yes** (to maintain systems and avoid bottlenecks)	See above	Where "white certificates" and commitments are introduced they concern the load level operations from these actors.
Energy supplier	**Yes** (as a business opportunity to shift loads and operate in pools)	**Yes ?** (primarily as a marketing instrument)	
IEA DSM-Programme tasks pertaining to utilities	**Task II, VIII, XI, XIII, XV and XVII**	**Task I, VI, VII, XIV and XVI**	-

A sustainable system combines energy efficiency and renewable energy



Is sustainable growth possible…



..without DSM and without global co-operation?

The IEA DSM-Programme can assist you with, e.g.

1. **ASSESSMENTS and EVALUATION of the DSM-situation (opportunities, organisation, potentials, technologies, training,incentive structures, etc.)**
2. **TRAINING of staff (for planning, programme-design, evaluation etc.)**
3. **TROUBLE-SHOOTING (and suggestion for programme development)**
4. **PROGRAMMES (target technologies, impact analysis)**
5. **PROJECTS (Technology Procurements, ESCO development, DR-implementation)**

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