

Demand Side Management, releases large scale efficiency

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The IEA DSM Programme

- Work begun in 1993
- With 17 OECD Countries (but open to all countries in the world) India and South Africa are about to join. Ireland, Germany and Egypt show interest. China is recommended to join. Mexico and ASEAN are contacted.
- Influenced by, but not limited to, the (Monopolised) Utilities role on the market
- Basically an issue of “least cost” application to make best use of resources

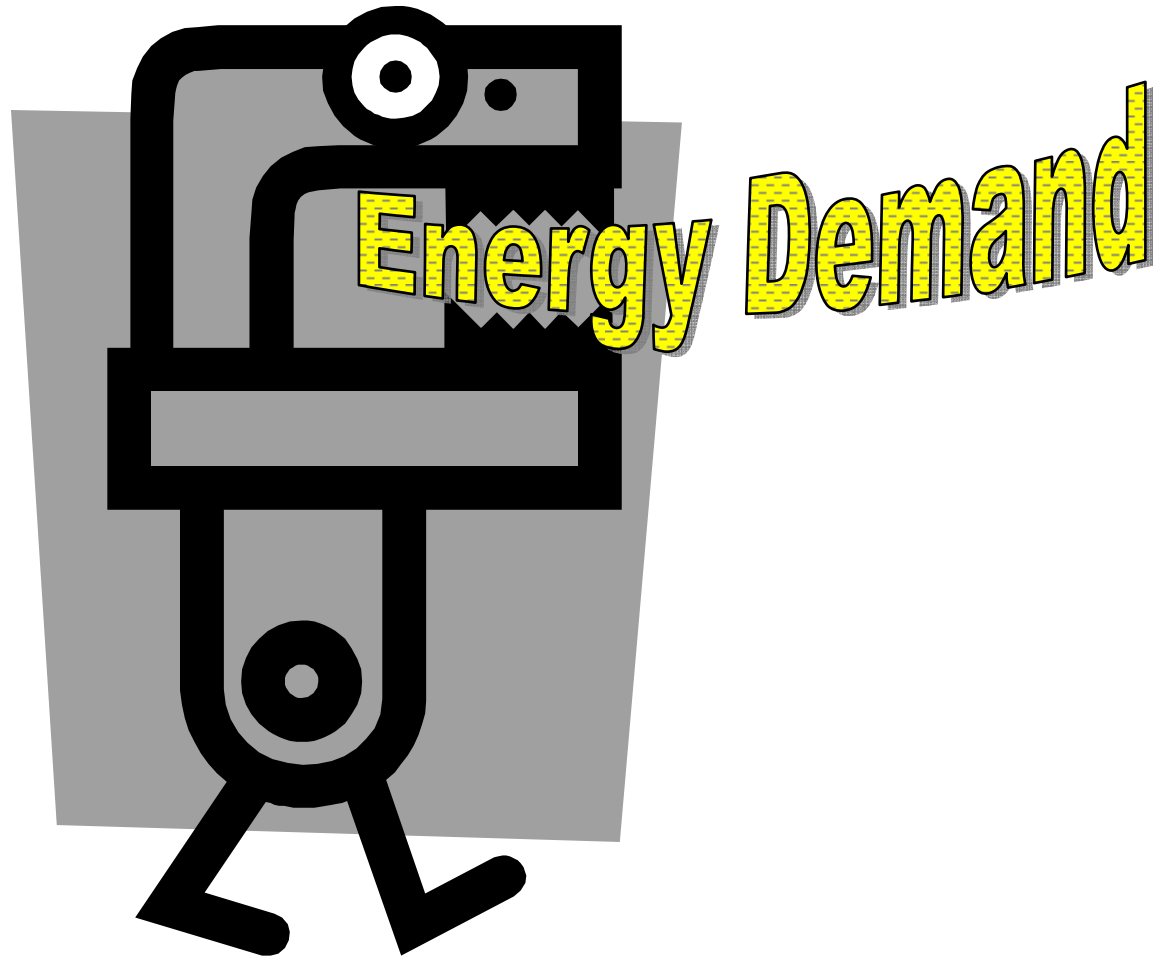
The problem is not one but several!

- **Load level** (Emissions and waste from too much supply for an inflated demand)
- **Load shape** (Too high peaks, too little reserve capacity and bottlenecks in the transmission)
- **Market responsibilities and market design** (who is the owner of the problem?)

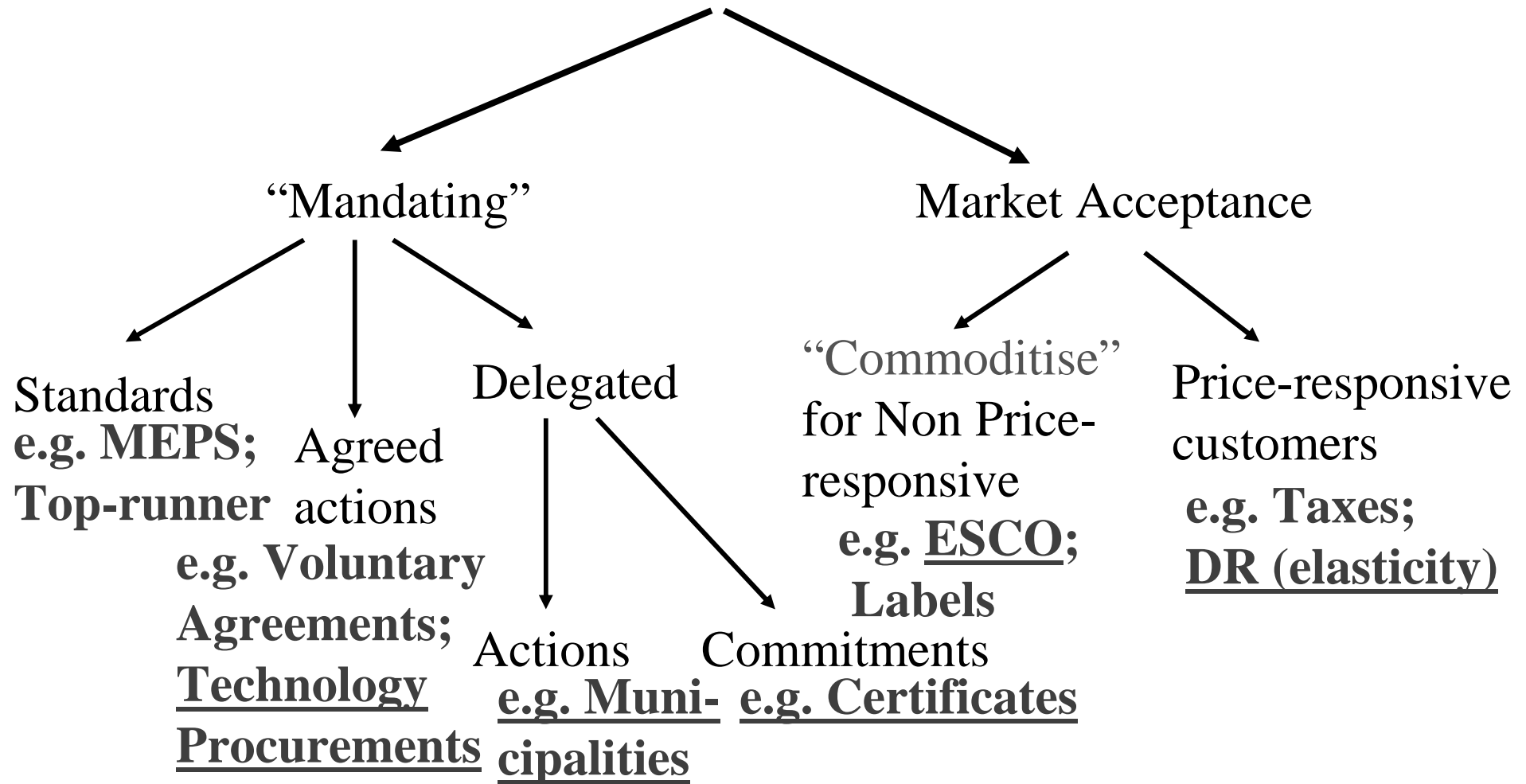
DSM is universal and does not only apply to utilities, electricity or monopolies!!

“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 (utility’s) load shape - i.e. changes in the pattern and magnitude of a (utility’s) load.”

DSM is a tool to make large scale energy efficiency possible



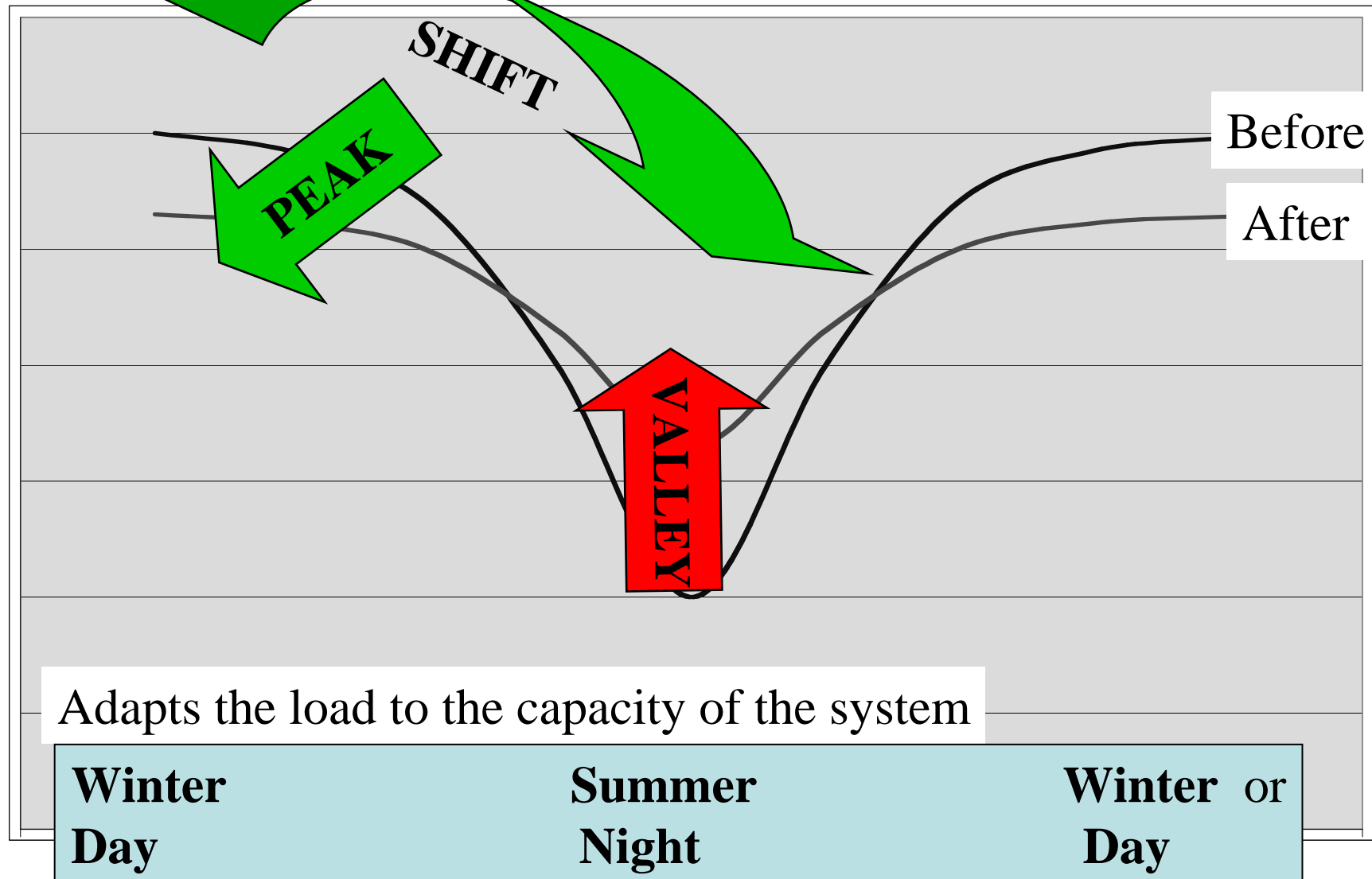
LARGE-SCALE ENERGY EFFICIENCY



The Mechanics of DSM



DSM can Change the LOAD SHAPE



The IEA_DSM work on LOAD SHAPE

FINALISED

- II. Communication Technologies
- VIII. Demand-Side Bidding in a Competitive Electricity Market

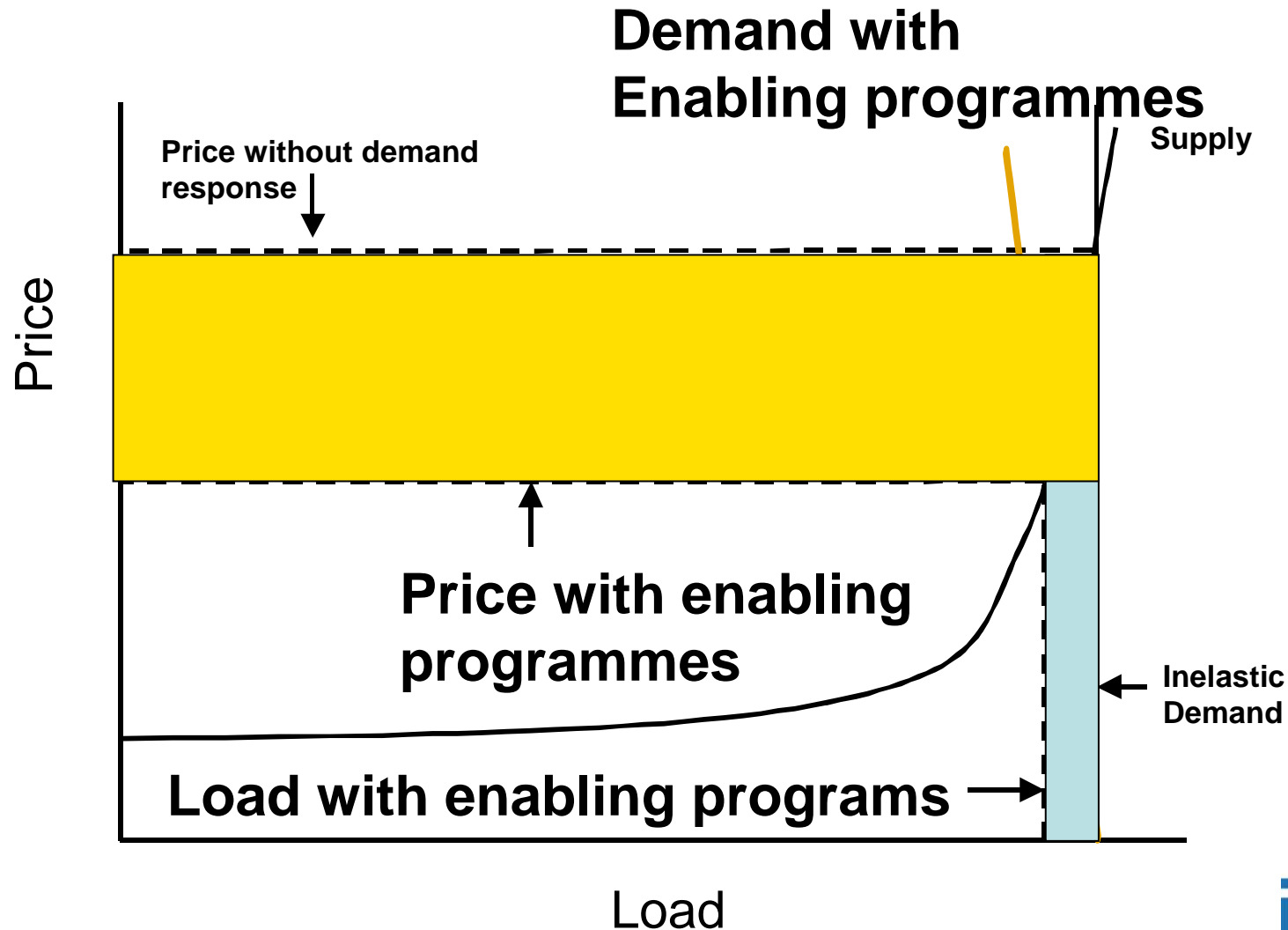
ACTIVE

- XI. Time of use pricing
- XIII. Demand response Resources, DR
- XV. Network driven DSM
- XVII Integration of DSM, Renewables and Distributed Generation

IN PREPARATION and DISCUSSED

- **Advanced Metering Infrastructure**
- **Rate-design**

DR and price volatility



Load Shape Technology

- MetersAND
- CommunicationsAND
- Software for calculation, billing, verification, settlementAND
- Pricing structure.....AND
- Institutional models.....AND
- End use capacity to accommodate (e.g. Storages)

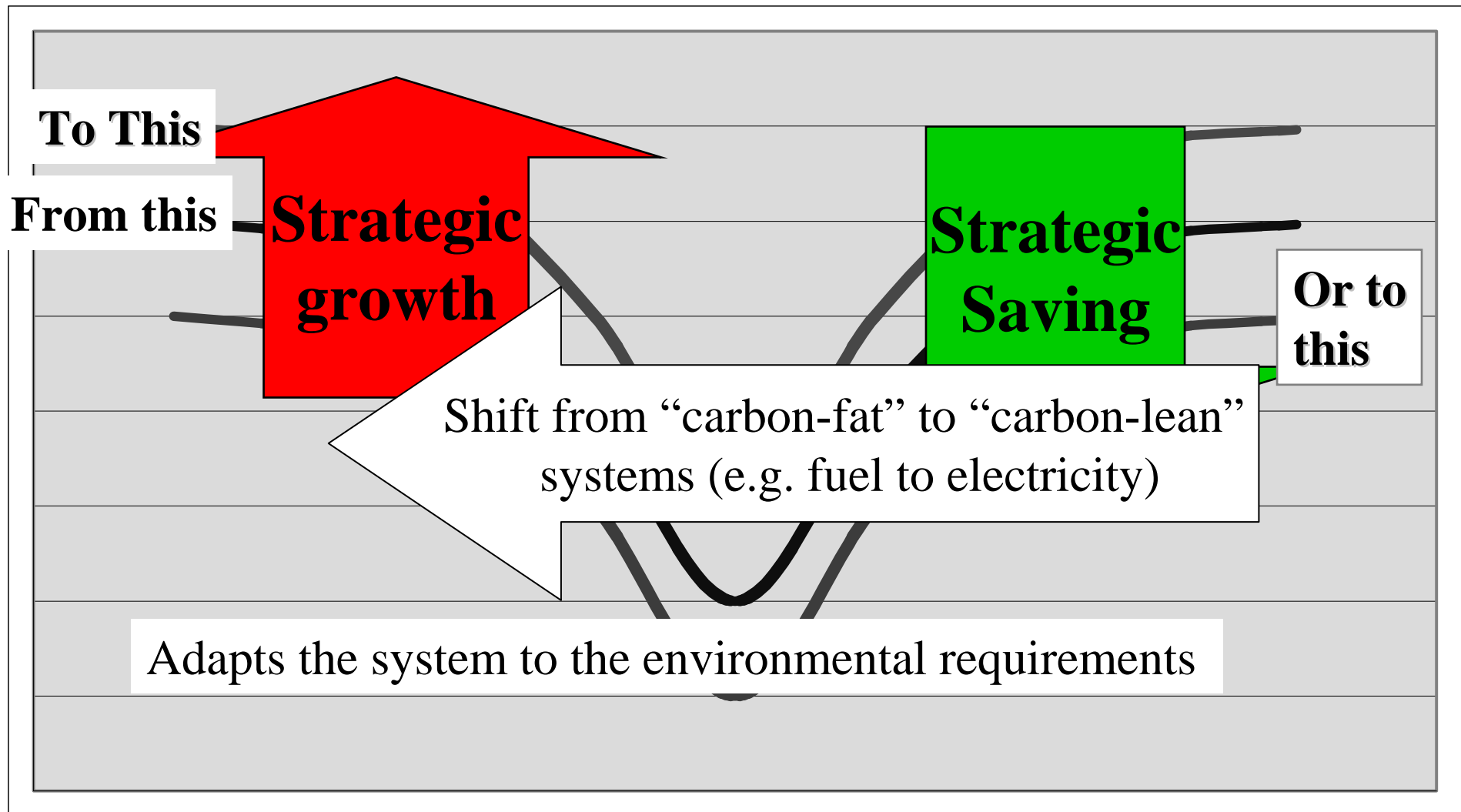
Policy guideline for load shape

Develop a regulatory regime that appoints responsibility for the resource adequacy

DELIVERS

- **Less Price Volatility** by improving short term price elasticity
- Improved **System Reliability** by reducing peaks and adding to safety margins
- Enhanced **System security** by reducing dependency on vulnerable supply resources
- Improved **Restoration capacity** by dispatching in/after emergency situations
- **Less costly network reinforcements** since energy efficiency measures will be active alternatives
- **Distributed generation** as alternative to transmission lines.
- Improved **operation and use of flowing renewable** sources
- **Elastic response** as complement to competition

DSM can change the LOAD LEVEL



The IEA-DSM work on LOAD LEVEL

FINALISED

- I. Database on DSM (INDEEP) + **Evaluation Handbook for Kyoto-related projects**
- III. Cooperative Procurement
- IV. Methods for Integrated Resource Planning
- V. Implementation of DSM in the Market Place
- VI. DSM in a changing Electricity Business environment
- VII. “Market Transformation”
- IX. The role of municipalities in a liberalised system
- X. Performance Contracting (ESCO)

ACTIVE

- **XII. Standards and labels (Pending)**
- **XIV. White Certificates**
- **XVI Competitive Energy Services**

IN PREPARATION and DISCUSSED

- **Advanced lighting programmes**
- **DSM Participation in System Operations (“Madrid Forums”)**
- **DSM and Climate Change**

Policy guideline for load level

Assess the least-cost delivery of energy services that includes both the demand and supply side.

DELIVERS MOTIVES FOR

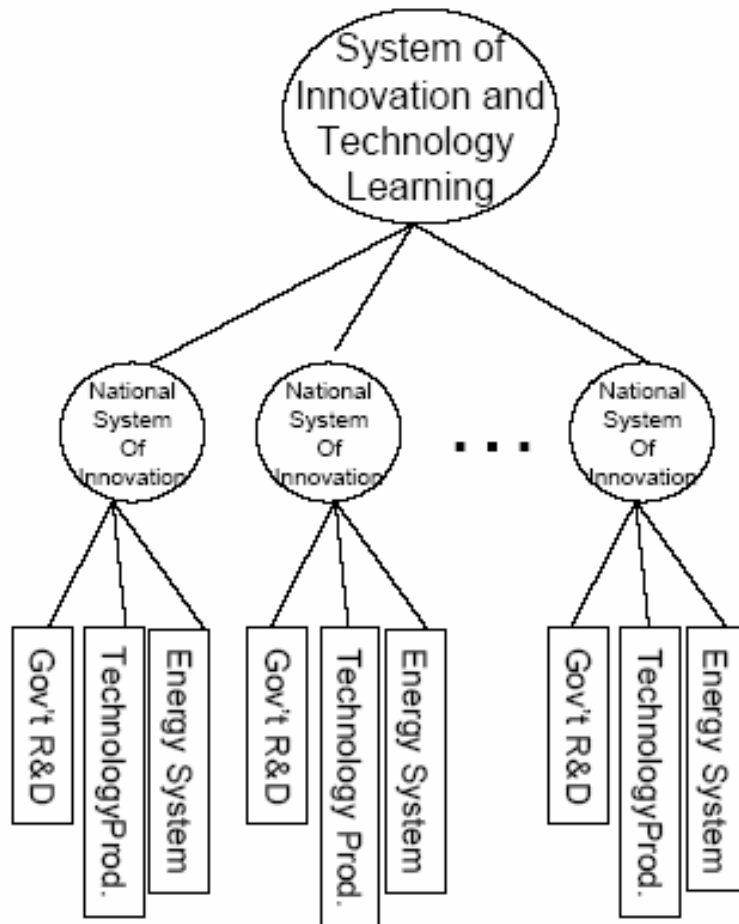
- **Energy service companies** and performance contracting
- **Allocation of commitments and obligations** that mobilises the actors
- **Organisation and targeting of support programmes** for energy efficient products
- Improved allocation of **obligations for reduction of GHG-emissions** between sectors and countries
- Improved use of **market communication mechanisms**, e.g. standards and labels
- Input to how further **research and support** mechanisms should be distributed among actors.

Collaboration (and its benefits)

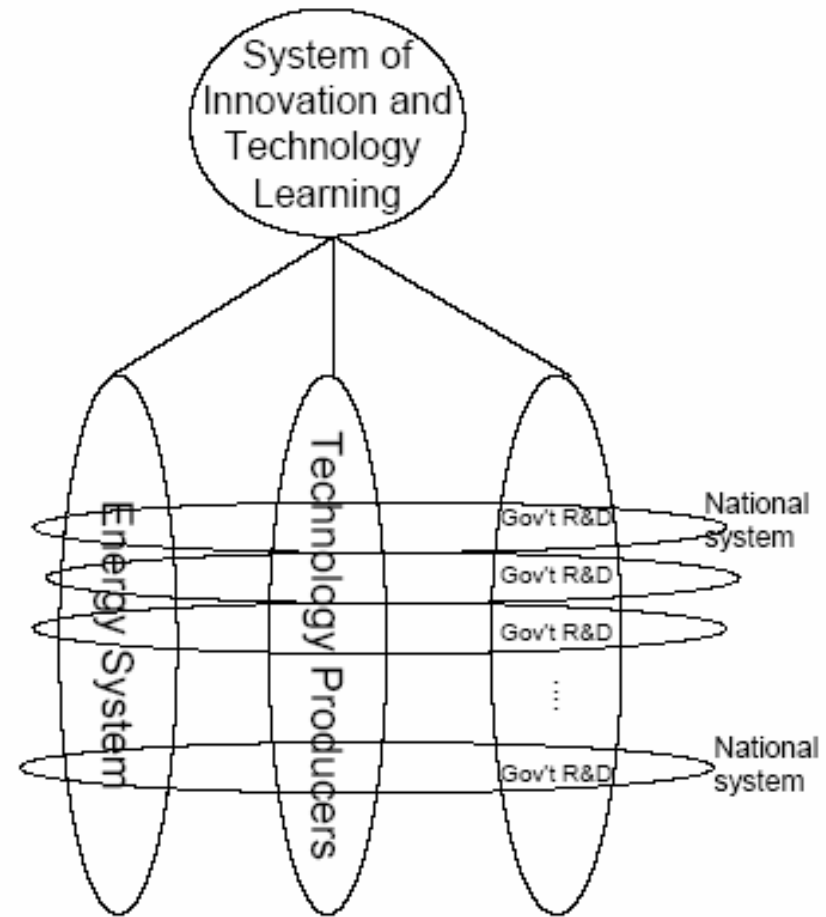


A globalised R&D network

Traditional



Globalisation perspective



Building Related IAs (BRIAs)

- Buildings and Community Systems (ECBCS)
- **Demand Side Management (DSM)**
- District Heating and Cooling (DH&C)
- Energy Storage
- Heat Pumps
- Solar Heating and Cooling (SH&C)
- Photovoltaic (PV)

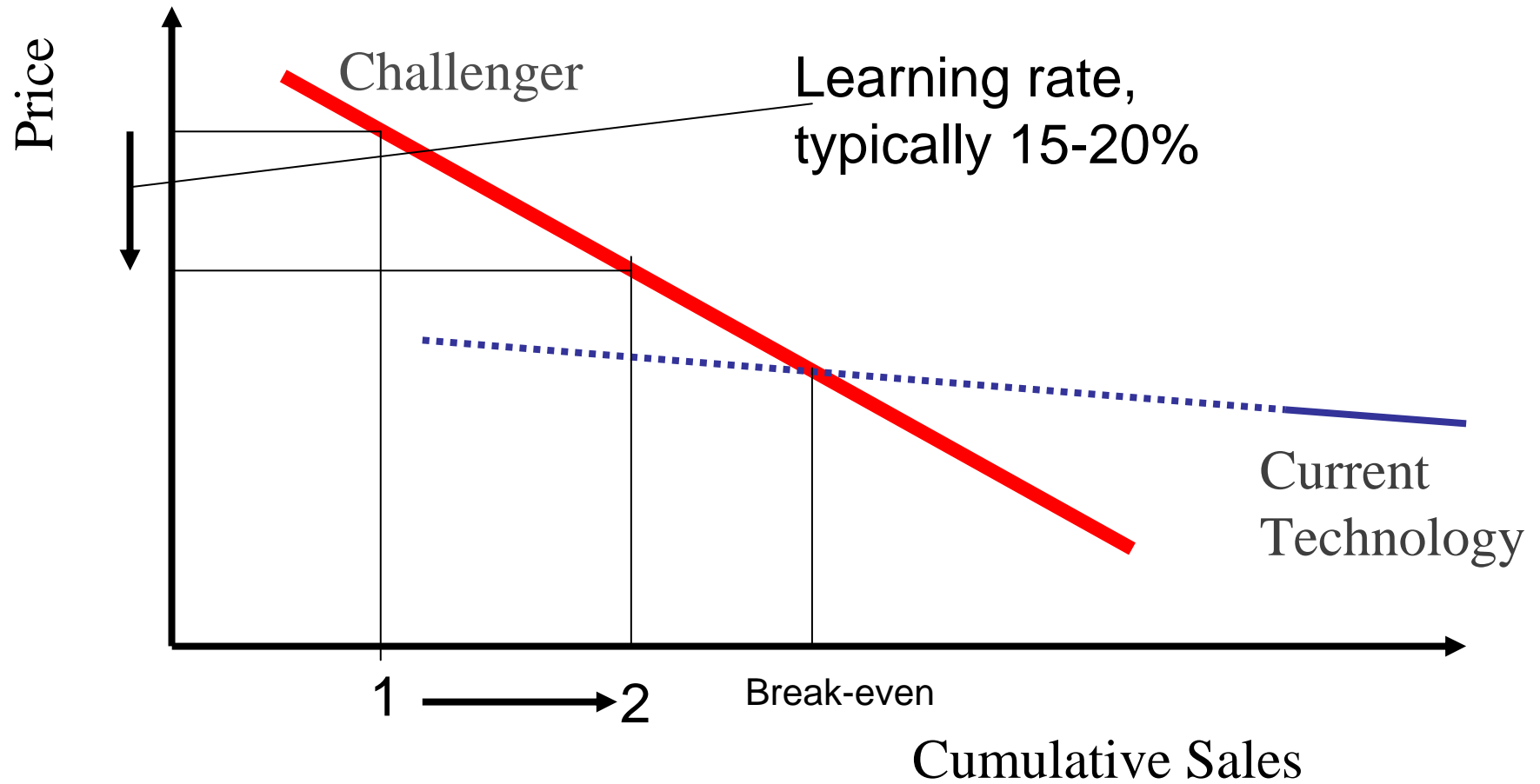
Co-operation in the IEA-family

The case of lighting

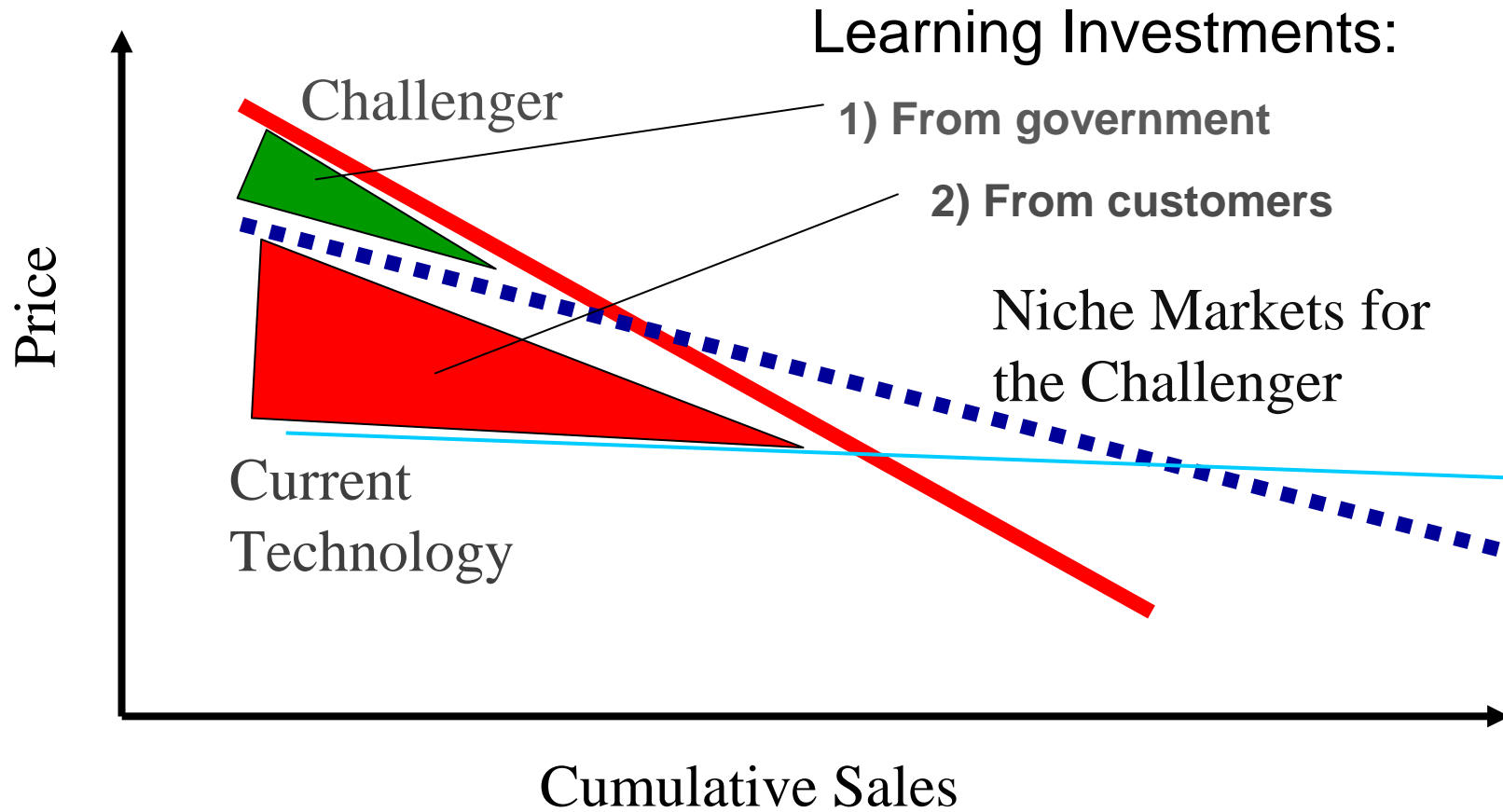
Issue	ECBCS	SHC	DSM	IEA Secretariat
Technologies and applications	X	X	Candidate technologies for programmes	<ul style="list-style-type: none"> • Useful policy mechanisms, • Institutional issues
Programmes and measures for aggregated dissemination	Features of technologies		X	
Policies and Measures	Important technology gains and trends		Market organisation development	X

The speed of cost reduction

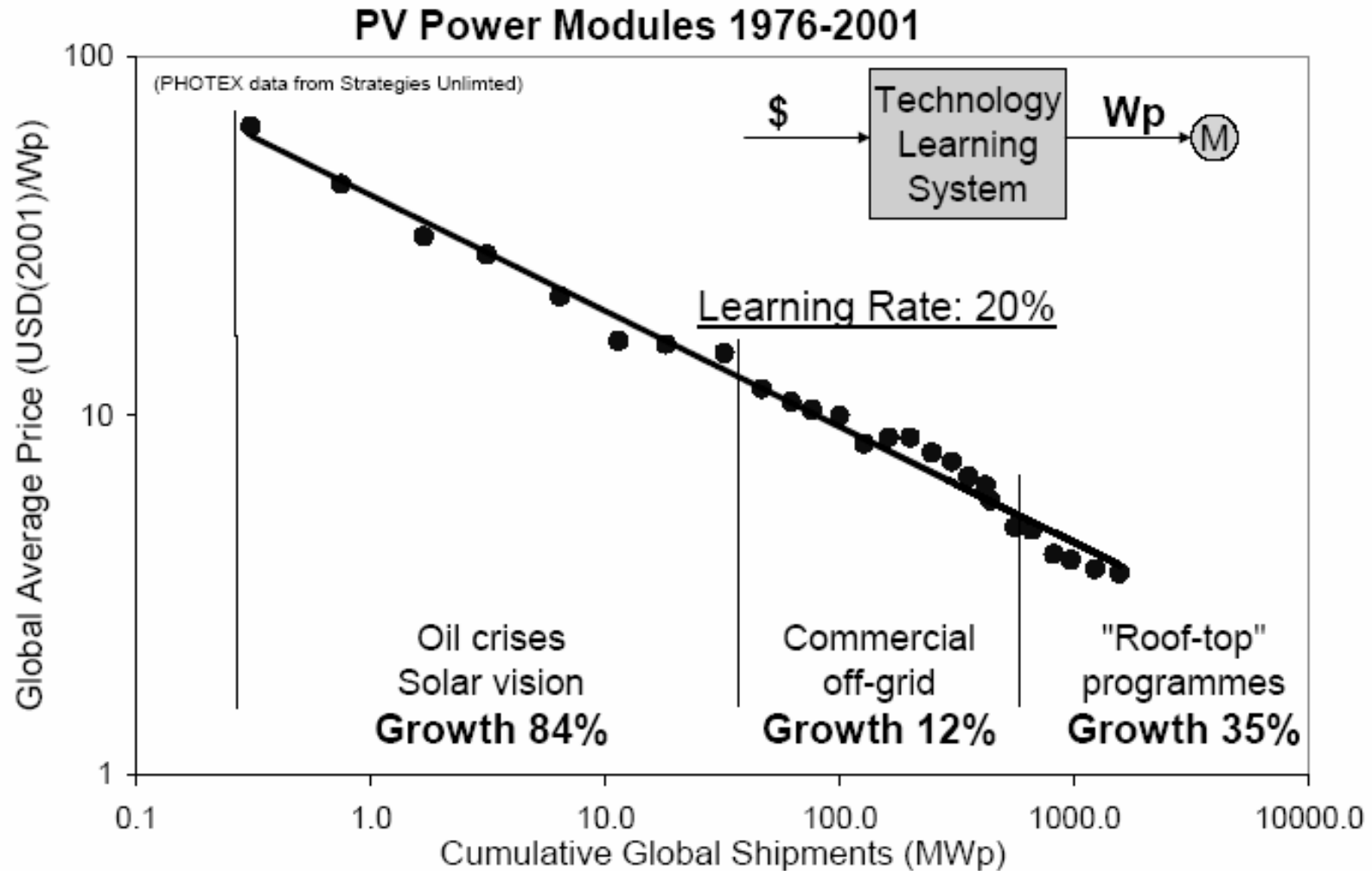
(NOTE: a straight line in double logarithmic scale)



Find and define the Niche Markets

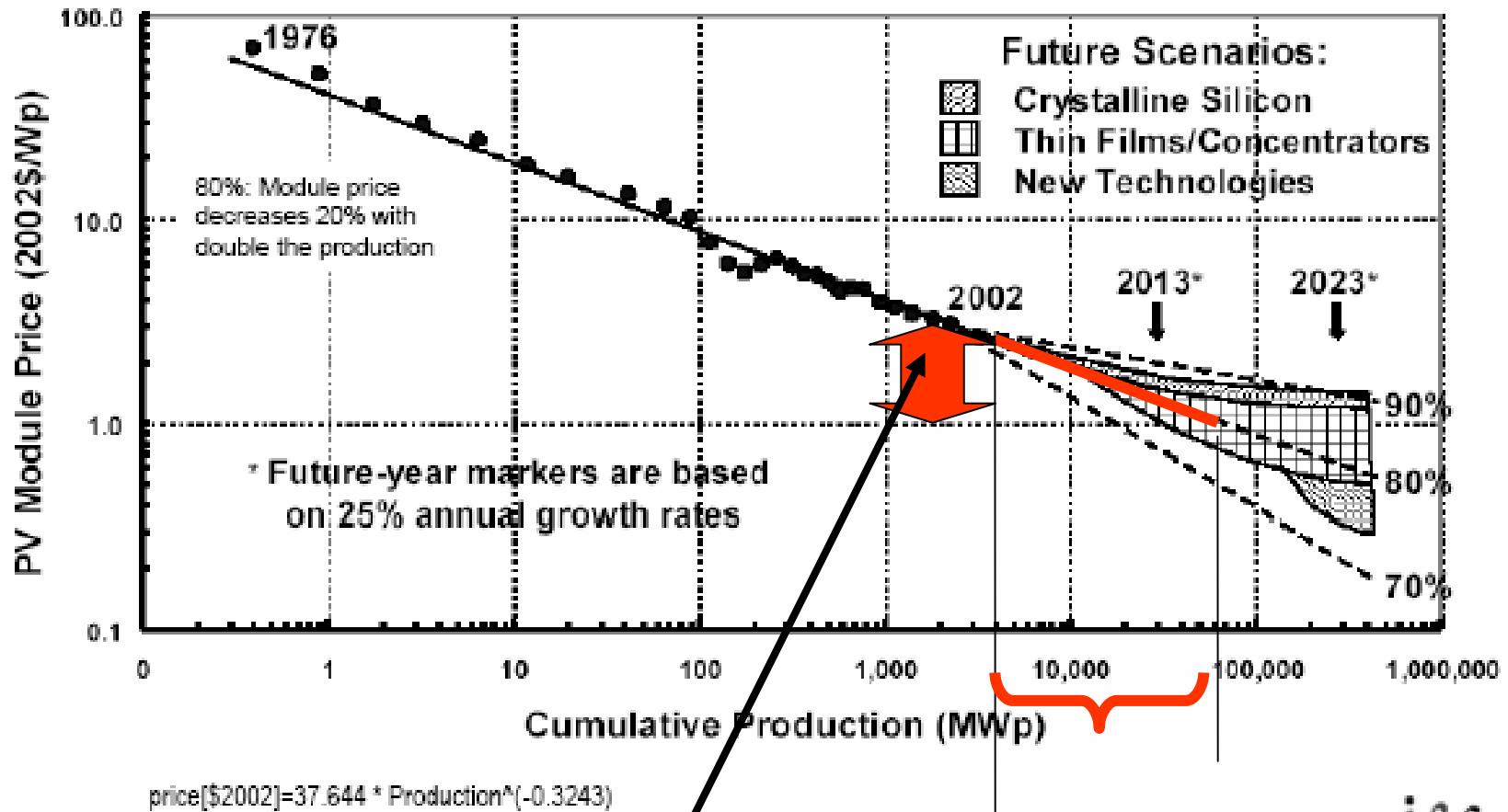


Tracked learning for PV



Technology Learning Curves

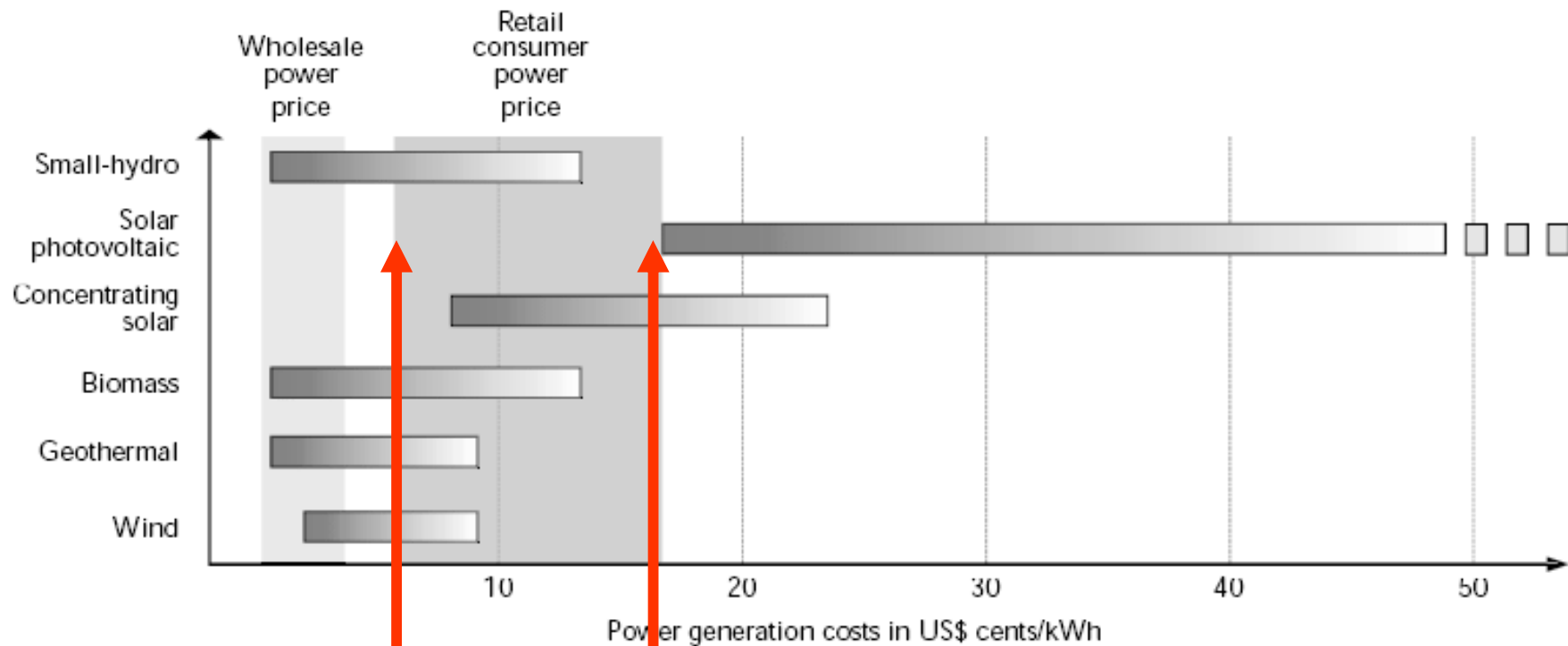
Joint Research Centre



Break-even

Learning into competitiveness

Figure 3-1. Cost Competitiveness of Selected Renewable Power Technologies

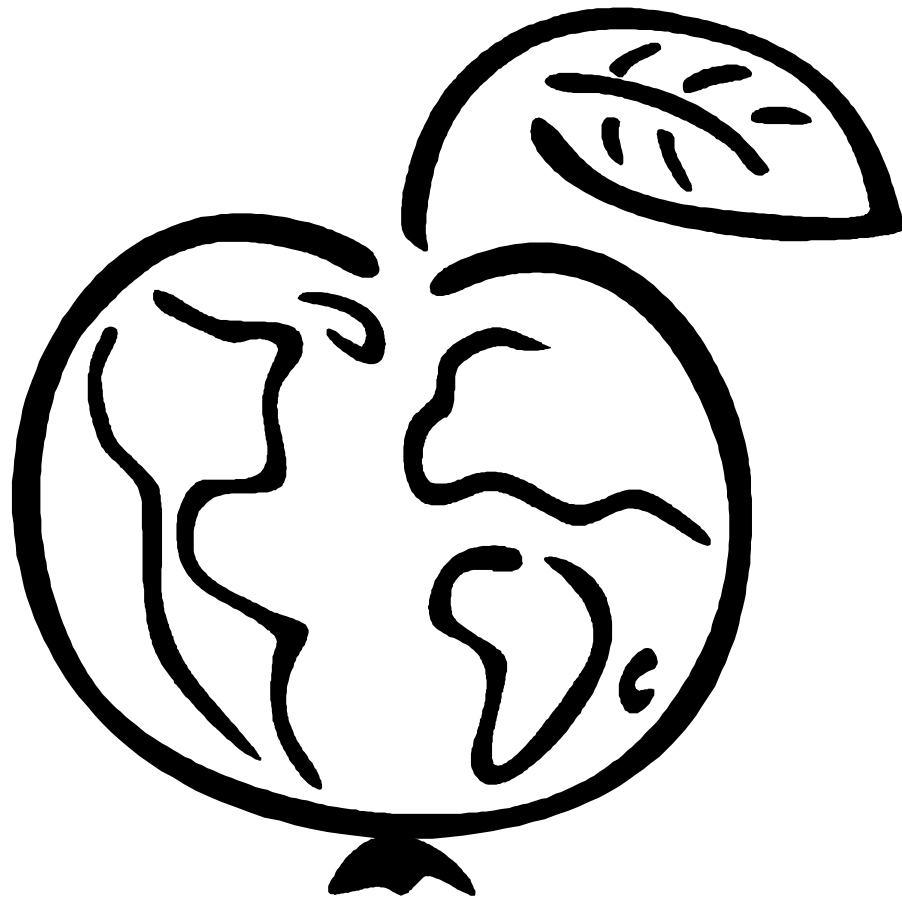


Note: Cost calculation is based on system investment needed (capital cost is based on discount rate of 6% and amortisation period of 15 - 25 years) and power output. Lowest cost range refers to optimum conditions (i.e., proven technology, optimised plant size and design, and high availability of system and resources). Source: NET Ltd, Switzerland.

1 \$/Wp

3 \$/Wp

Is sustainable growth possible...



..without DSM
and without
global co-
operation?

<http://dsm.iea.org>



Some family-businesses

- 1. Market Re-design Options** (Demand Response, Certificates opportunities)
- 2. Models and initiatives for boosting technologies** (Aggregated Procurements, Dynamic top-focused standards, Clearinghouses for programmes and projects e.g. CDM/JI related)
- 3. Networking and initiatives to reinforce services and promotions** (ESCOs, Marketing, Municipality involvement)
- 4. Lighting development**
- 5. Tailoring Programmes and Measures**