

DSM

Past, present and future

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Chairman of the IEA DSM-Programme



IEA-DSM (a growing family)

Australia

Austria

Belgium

Canada

Denmark

Finland

France

Greece

India

New Zealand

Italy

Japan (**Japan Facility Solutions**)

Korea

Netherlands

Norway

Spain

Sweden

United Kingdom

United States

Switzerland

Schneider Electric

South Africa (ip) China (obs)

Eurelectric (obs)

Edison Electric Inst. (inv)

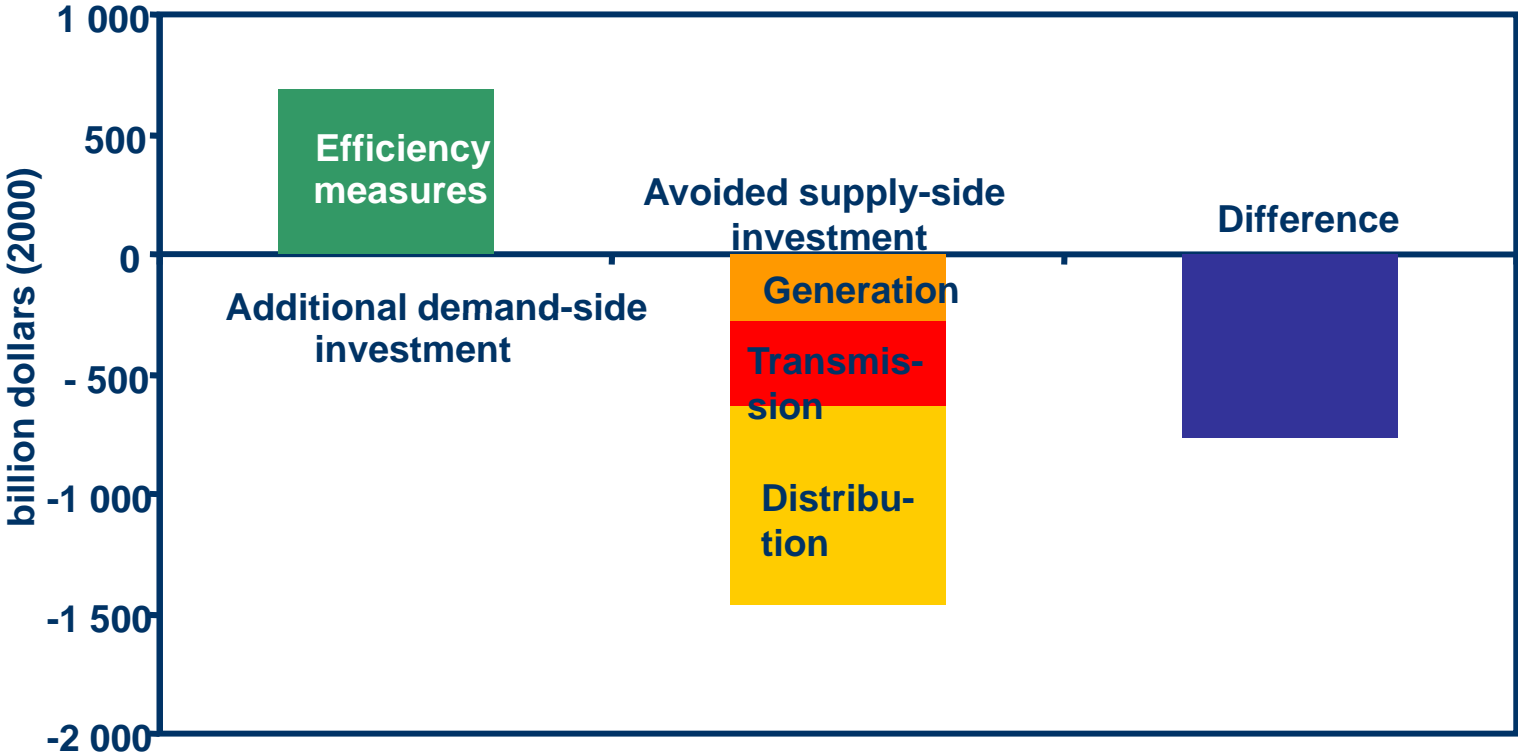
ICLEI (inv)

The Regulatory Assistance Project (obs)



www.ieadsm.org

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

The strategy of the IEA DSM Programme

- Vision: *Demand side activities should be **the first choice** in all energy policy decisions designed to create more reliable and more sustainable energy systems.*
- Mission: *To deliver to our stakeholders useful information and effective guidance for crafting and implementing **DSM policies and measures**, along with the necessary technologies and applications, which together can transform markets and facilitate energy system operations.*

The imperative logic of Demand Side Management

- A better use of resources equals **lower cost** for service
- A balanced use of resources means a more **secure and reliable** energy supply
- An expansion for products/services using less energy (using more wisely) is an injection for **future business**
- A step change in improved energy efficiency is the only way to achieve wide-spread **welfare** without resources depletion

What is DSM?

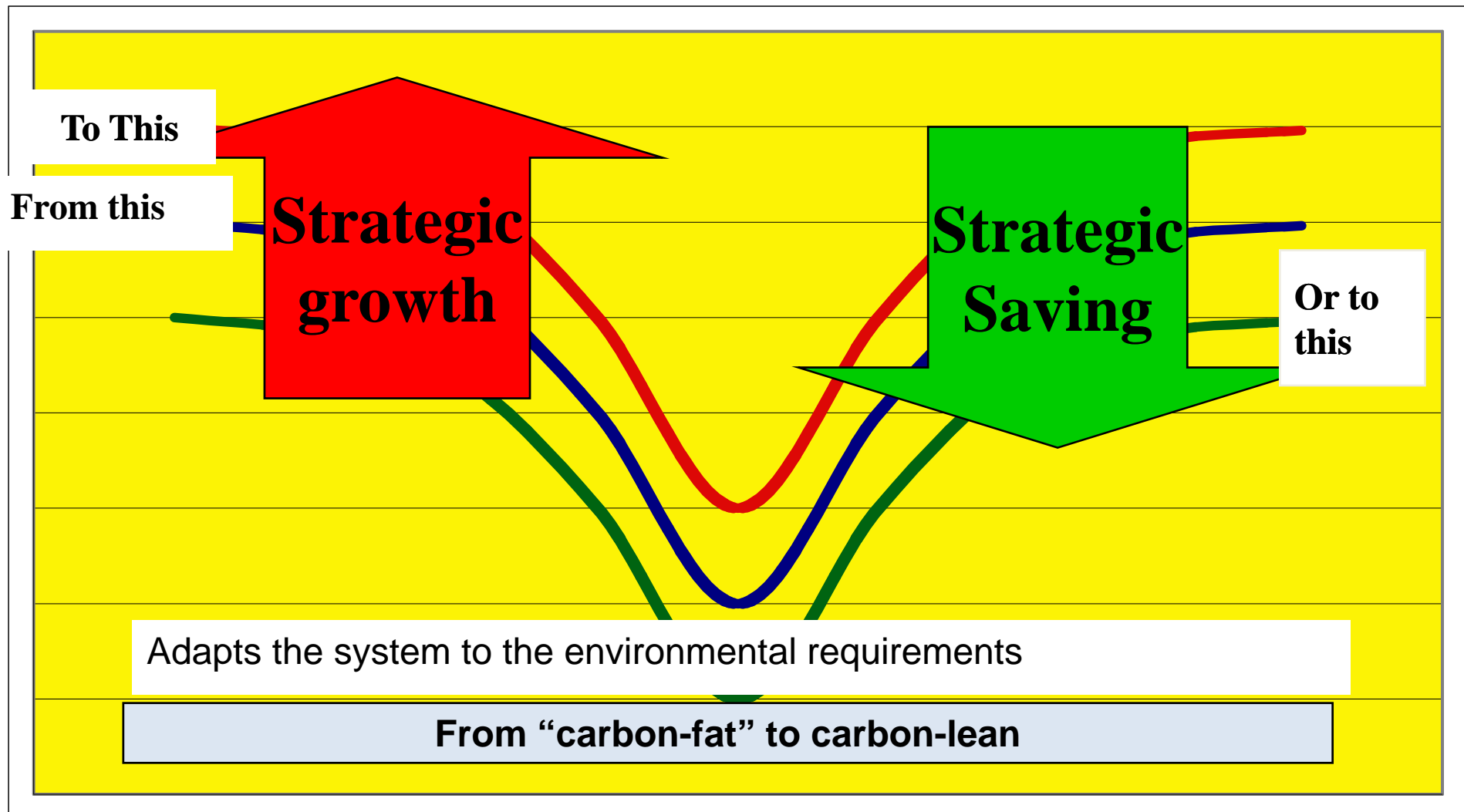
- DSM is universal and does not only apply to utilities, electricity or monopolies
- DSM encompasses the entire range of management functions (**planning, evaluation, implementation and monitoring**)
- DSM = Large-Scale Deployment of Energy Efficient Equipment by use of specially designed Programmes



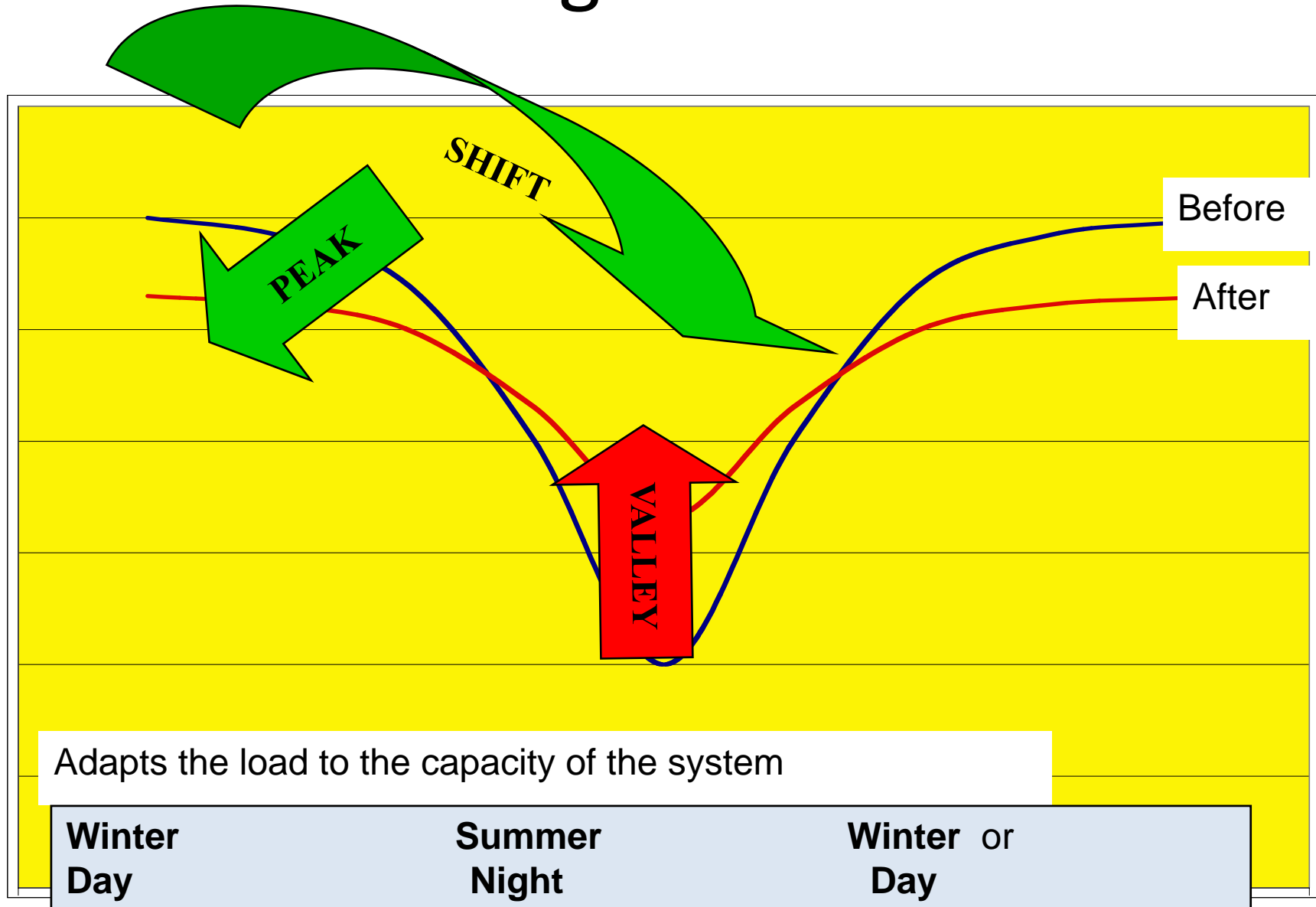
The issues!

- **Load level**
 - a wasteful demand requires too much supply for the specific needs
- **Load shape**
 - high peaks,
 - little reserve capacity,
 - bottlenecks in transmission and distribution
- **Market responsibilities**
 - who is the owner of the problem?

DSM can change the LOAD LEVEL



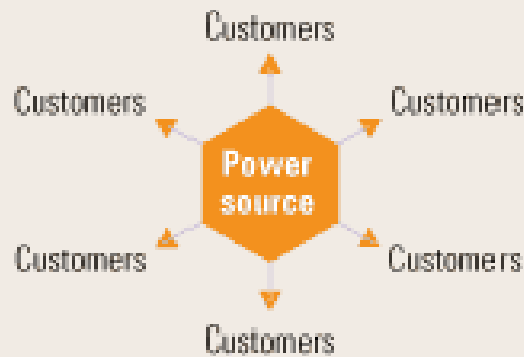
DSM can Change the LOAD SHAPE



Future Business – The two extremes

- **Technology driven** (Adapt and combine technologies). Stakeholders are already identified actors who enters when the incentives are right
- **Service driven** (Adapt business structure). Some stakeholders are new emerging and integrated to deliver services in accordance with needs and regulations)

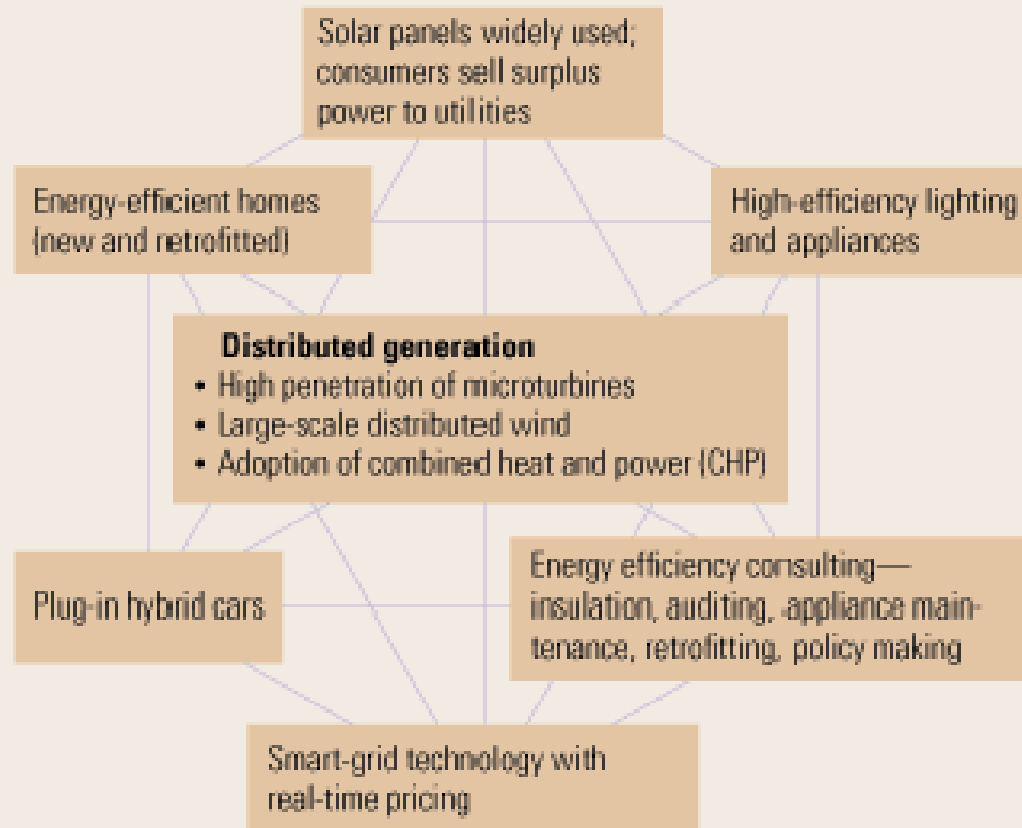
From the traditional utility ...



Current utility business model

- Highly centralized asset model with focus on infrastructure, capital programs
- Interaction with customers consists of producing and delivering electricity to meet demand
- Success driven by regulatory relationships, core business performance

... to the utility of the future



Potential utility business model

- Decentralized asset model with infrastructure featuring technology advances
- Customer interaction involves education/marketing, behavior modeling, and financing of services/new technology
- Success driven by revenue retention, partnering, and customer interaction



Business interest in DSM

Actor	Peak Load	Load Level
Generation company	No (prices are set on the margin)	No (loss of sales)
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)
Transmission and Distribution	Yes (to maintain systems and avoid bottlenecks)	
Energy supplier	Sometimes (as a business opportunity to shift loads and operate in pools)	Sometimes (primarily as a marketing instrument)
ESCOs EPCs	Sometimes	Yes Indeed
Aggregators	Very much	Sometimes
Installation and building companies	Yes	yes

Past, Present and Future Tasks

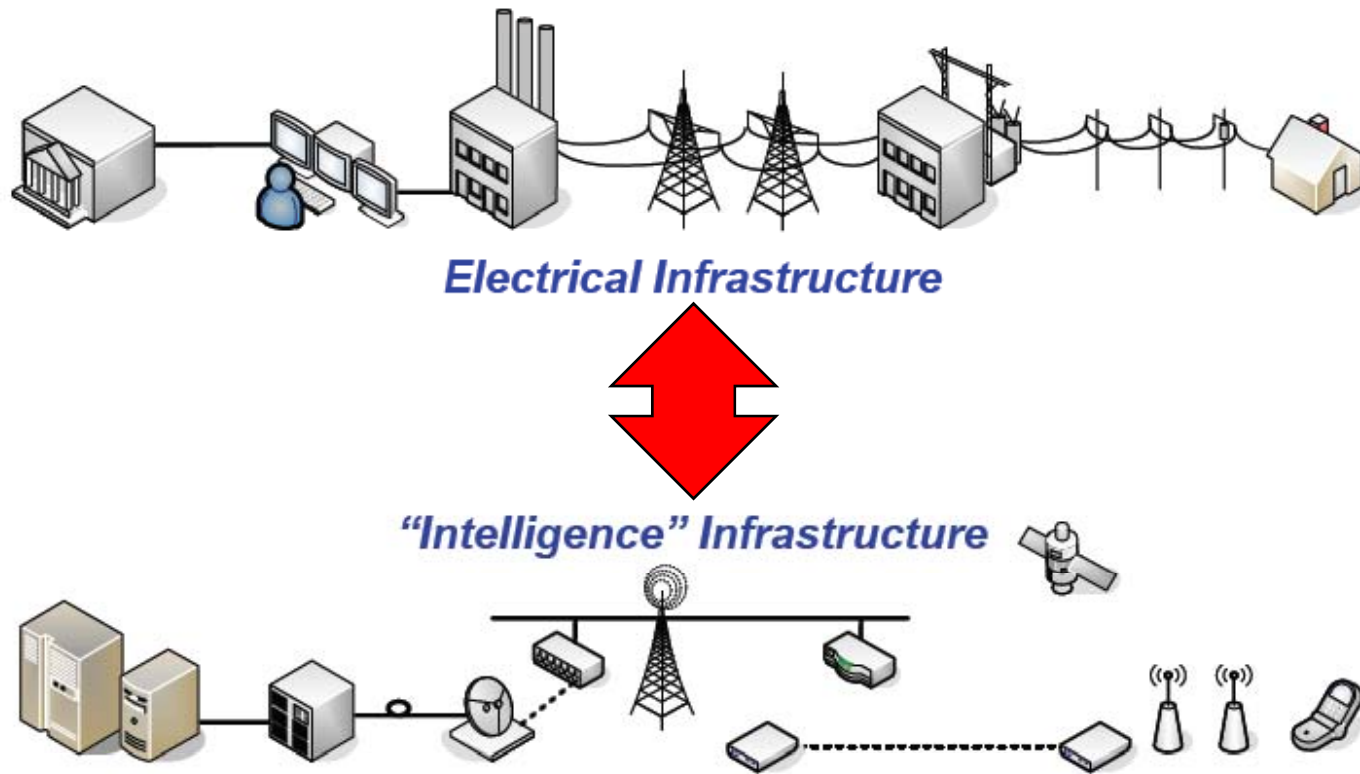
		Business interest in DSM	
Status of Task		Peak Load	Load Level
Past, Present and Future IEA DSM-Programme tasks Further information on the activities can be found at www.ieadsm.org .	Completed	Task II: Communications Technologies for Demand-Side Management Task VIII: Demand-Side Bidding in a Competitive Electricity Market Task XI: Time of Use Pricing and Energy Use for Demand Management Delivery Task XIII: Demand Response Resources Task XV: Network-driven DSM	Task I: Subtask 9 – Evaluation Guidebook on the impact of DSM and Energy Efficiency Programmes Task III: Technology procurement Task V: Marketing of Energy Efficiency Task VI: Mechanisms for Promoting DSM and Energy Efficiency in Changing Electricity Businesses Task VII: Market Transformation Task IX: The Role of Municipalities in a Liberalised System Task X: Performance Contracting Task XIV: Market Mechanisms for White Certificates Trading
	Current	Task XVII: Integration of Demand Side Management, Energy Efficiency, Distributed Generation and Renewable Energy Sources Task XIX: Micro Demand Response and Energy Saving	Task XVI: Competitive Energy Services Task XVIII: Demand Side Management and Climate Change Task XX: Branding of Energy Efficiency Task XXI: Standardisation of Energy Efficiency Calculations
	Proposed		<ul style="list-style-type: none"> - Utility Carbon Offset Toolkit - Energy Efficiency Portfolio Standards

Change Agents (companies, intermediaries, catalysts)

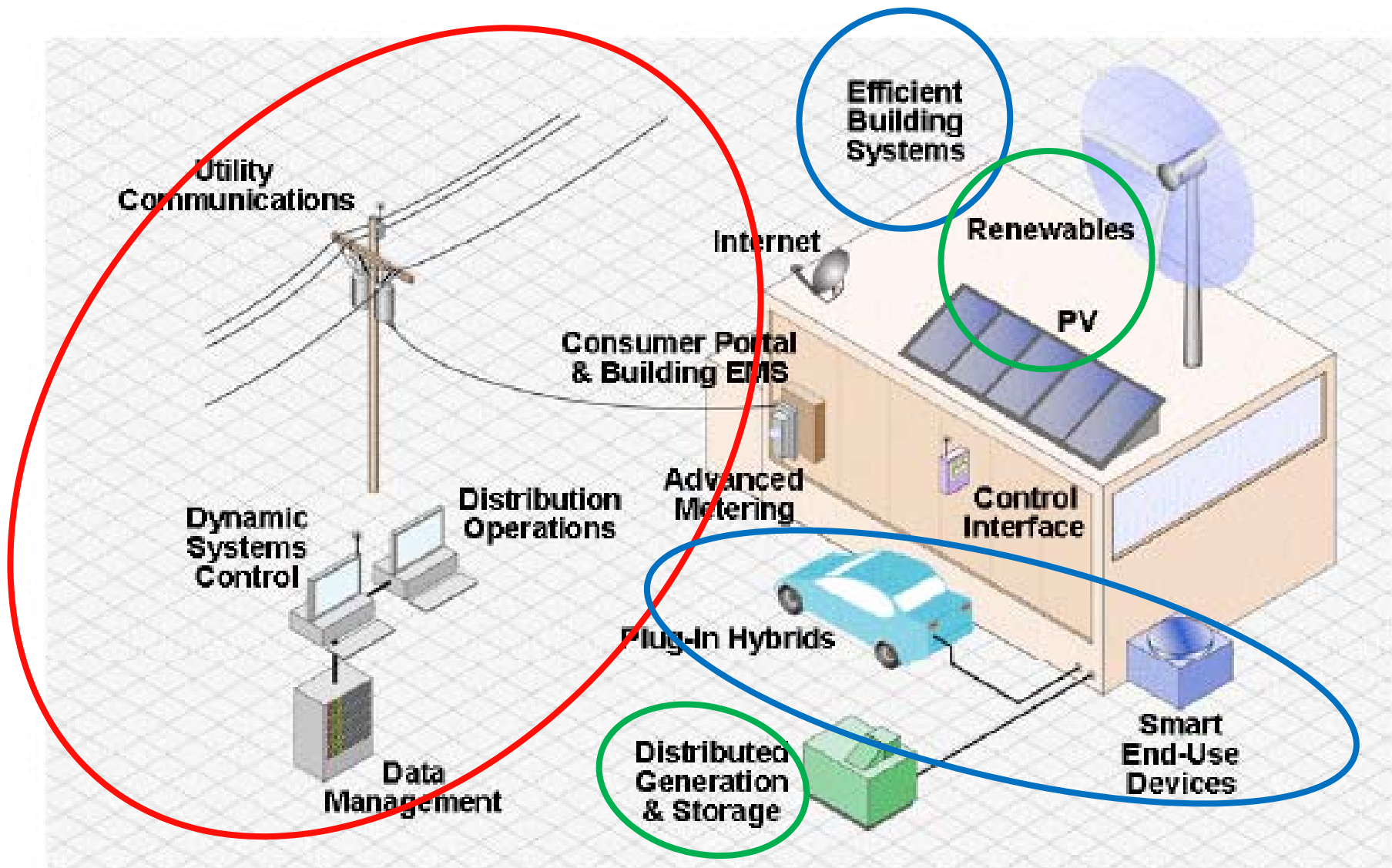
DSM-concept		Change agent role	Example
Classic (addressing utilities as they are)	Monopolised markets	Deliver products and services	Paradip Port (India)
	Customer aggregation	Fundraising	Public Benefit Charges (USA)
	Liberalised markets	Mandate utilities to achieve a set level of energy efficiency	White Certificates (Italy and some Australian states) and EE Commitment (UK)
Incentivising utilities to deliver energy efficiency		Decouple profit from sales volume	California Investor-owned Utilities
Energy Efficiency Power Station		Aggregate energy efficiency projects to the scale of a virtual power plant	Jiangsu, Shanghai and Guangdong (China) Efficiency Vermont
Government Deployment schemes		Aggregation of purchasing power	FEMP (USA), Technology procurement (Sweden)

The smart grid – A happy marriage ?

Achieving the Power Delivery System of the Future: *Integrating Two Infrastructures*



New Technologies



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

Policy drivers

APPROACH	TYPE		EXAMPLE
Mandated	Standards		<ul style="list-style-type: none"> • Minimum performance (MEPS) • Top-runner standard
	"Agreed Actions"		<ul style="list-style-type: none"> • Voluntary Agreements • Technology Procurements
	Delegated Actions	By actor	<ul style="list-style-type: none"> • Regional bodies • Municipalities
		By Means	<ul style="list-style-type: none"> • Commitments • Certificates
Market Acceptance	Price-responsive customers		<ul style="list-style-type: none"> • Taxes: Tax reduction • Price elasticity (Demand Response)
	Non-price responsive customers	"Commoditising" energy efficiency	<ul style="list-style-type: none"> • Energy Services (ESCO) • Labels

Climate

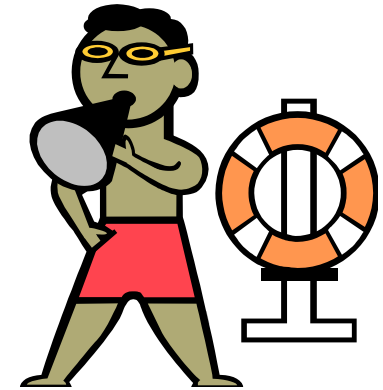


- Strong policy-drive gives many opportunities to find support for focused programmes, especially when fossil fuel is targeted and renewables promoted
- Crosscountry activities in e.g. CDM
- Emission rights trade and carbon taxes provide financial incentives

Energy Efficiency is the first step on the road to sustainability

		Supply	
		High Density <i>(e.g. fossil, nuclear)</i>	Low Density <i>(e.g. solar, wind, bio)</i>
End-Use of Energy	High Efficiency (Low Intensity) <i>e.g. CFL and LED lighting; Adjustable speed drives</i>	UNECONOMICAL	SUSTAINABLE
	Low Efficiency (High Intensity) <i>e.g. Incandescent lamps, Direct electrical heating</i>	PRESENT SYSTEM	HARDLY FEASIBLE

Energy Security



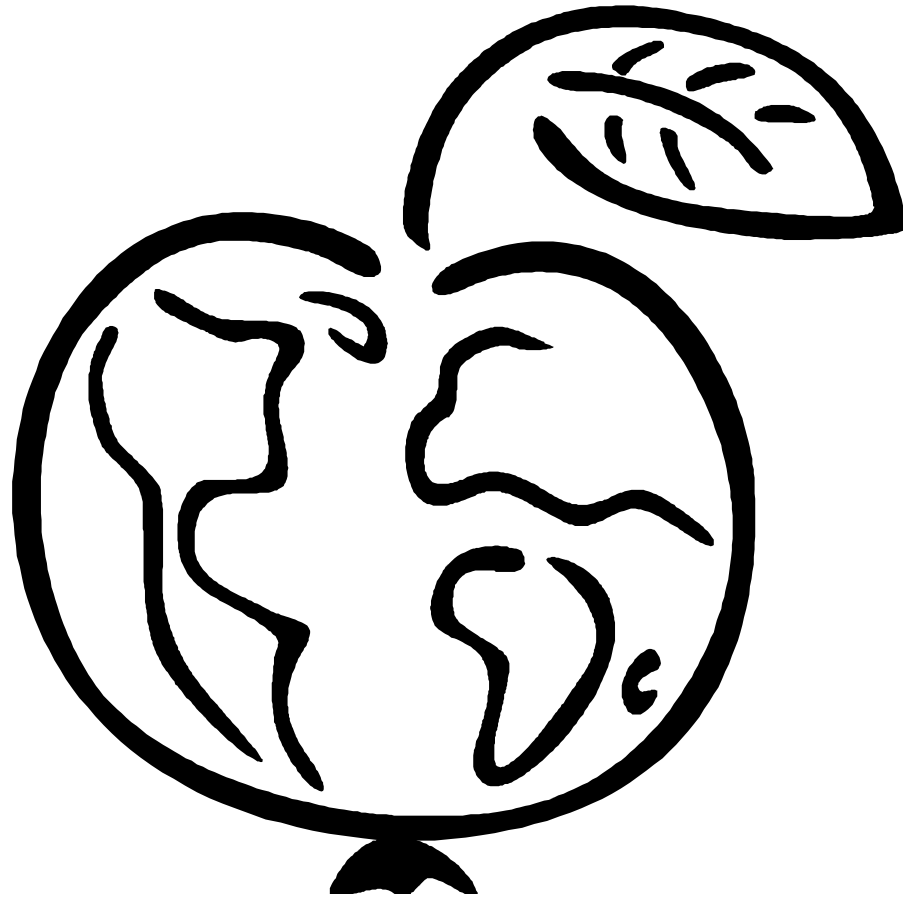
- Fuel and system diversification is increasingly important and is coupled to use of distributed generation
- Supplier market position and demand elasticity is an issue with policy implications (windfall profits)

Industry development



- The ongoing crisis gives policy incentives to develop new industries, especially related to "smart grid" functions
- Job creation
- Changes requires new partnerships where technologies meet market skill

Is sustainable growth
possible...



..without DSM
and without
global co-
operation?

www.ieadsm.org

