

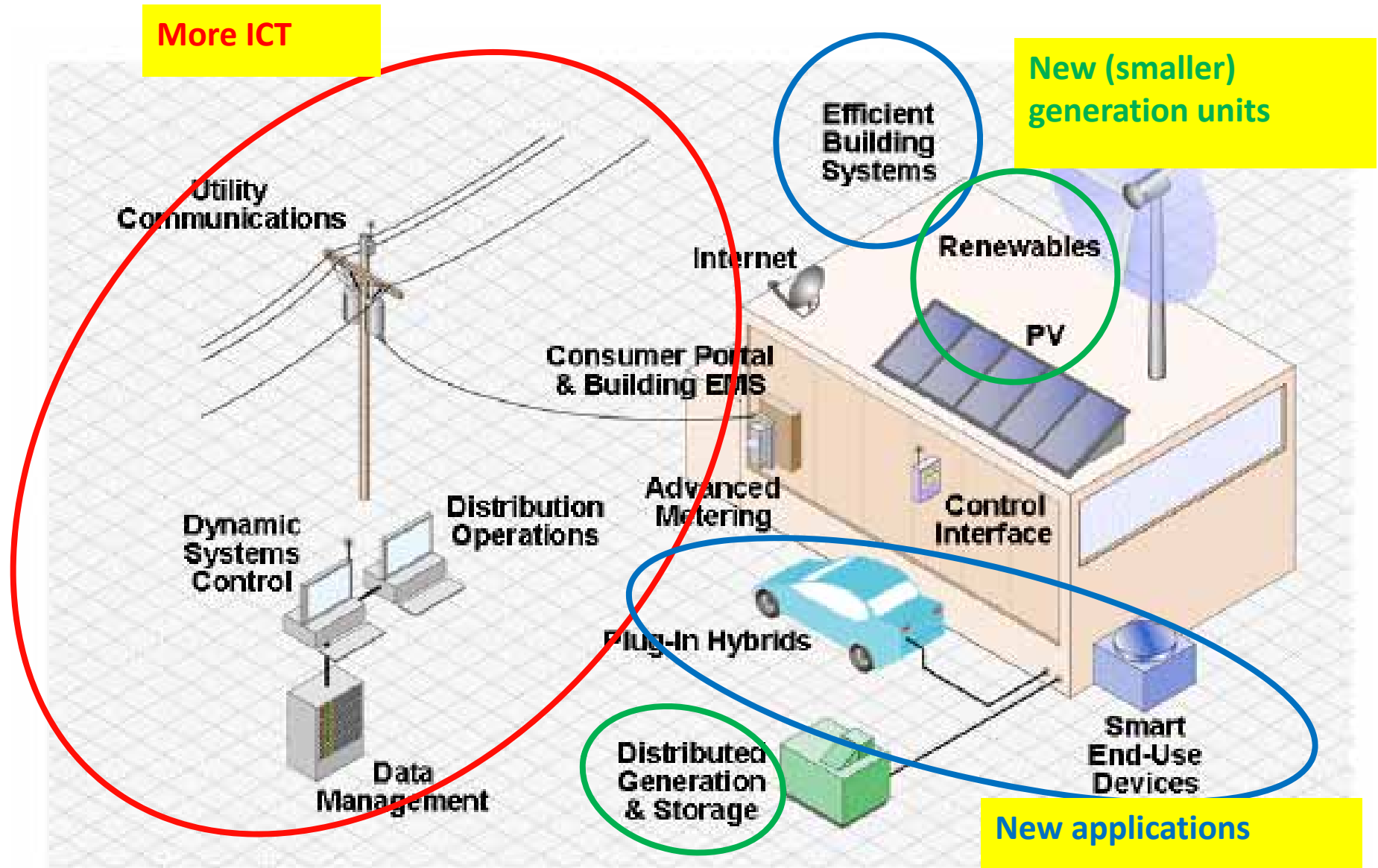
# The DSM University - A tool for capacity building

Hans Nilsson

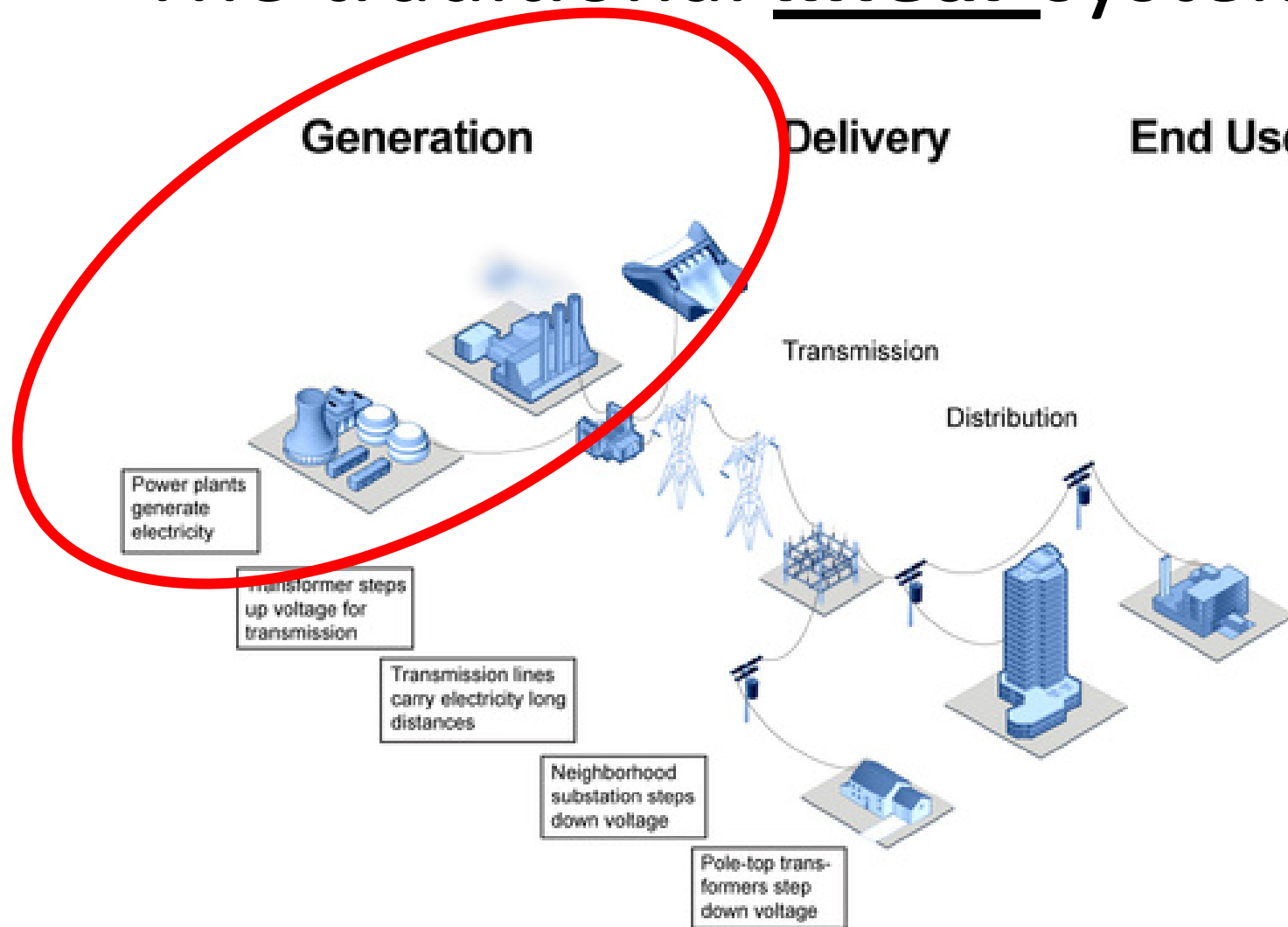
# **We live in a period of profound changes**

- 1. Technologies will allow greater participation and more choices.
- 2. The energy system will change from being composed from single supply units to a multitude connected in a mesh

# New Technologies will change business



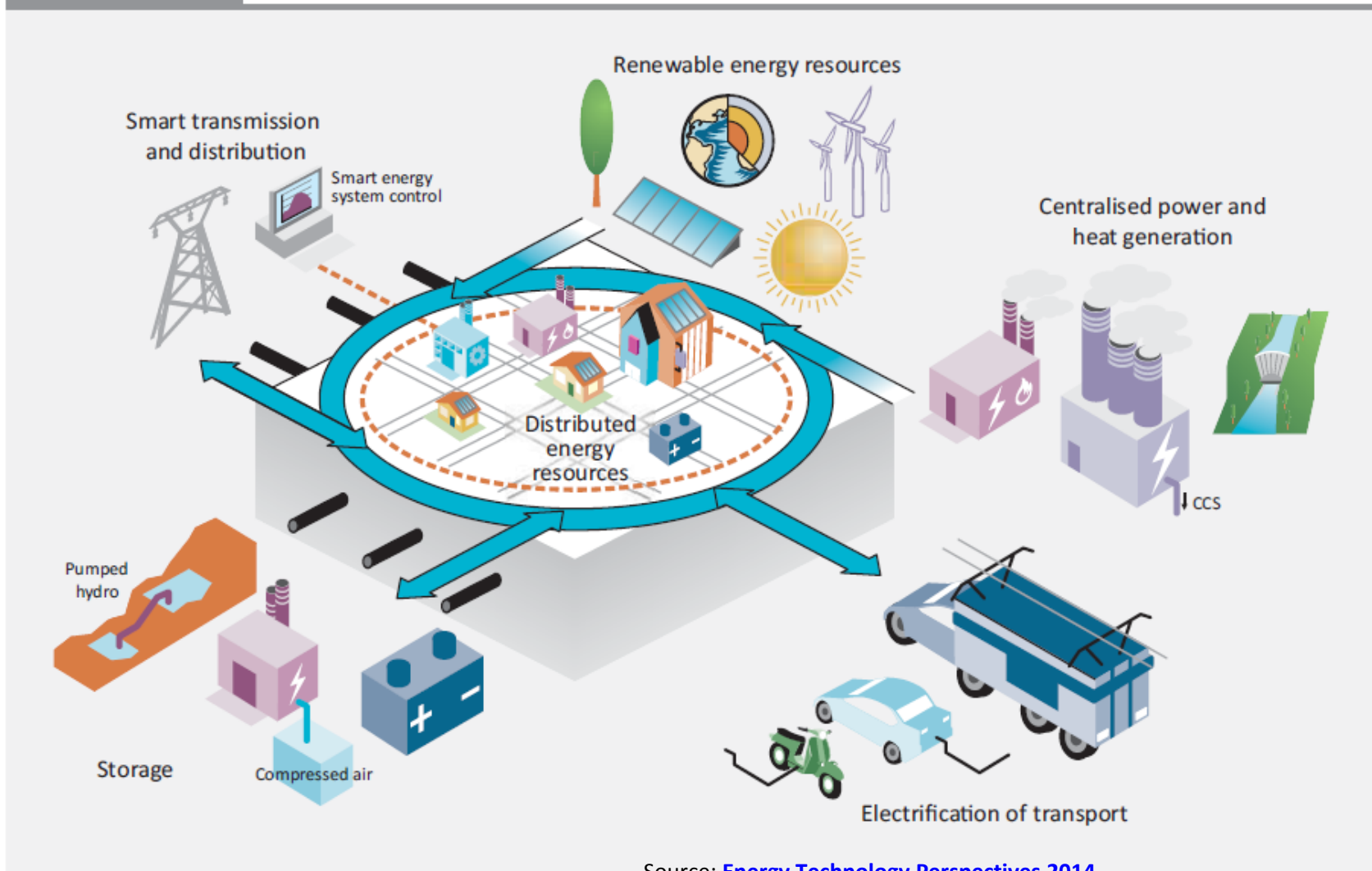
# The traditional linear system



# The new mesh system

Figure I.2

The integrated and intelligent electricity system of the future

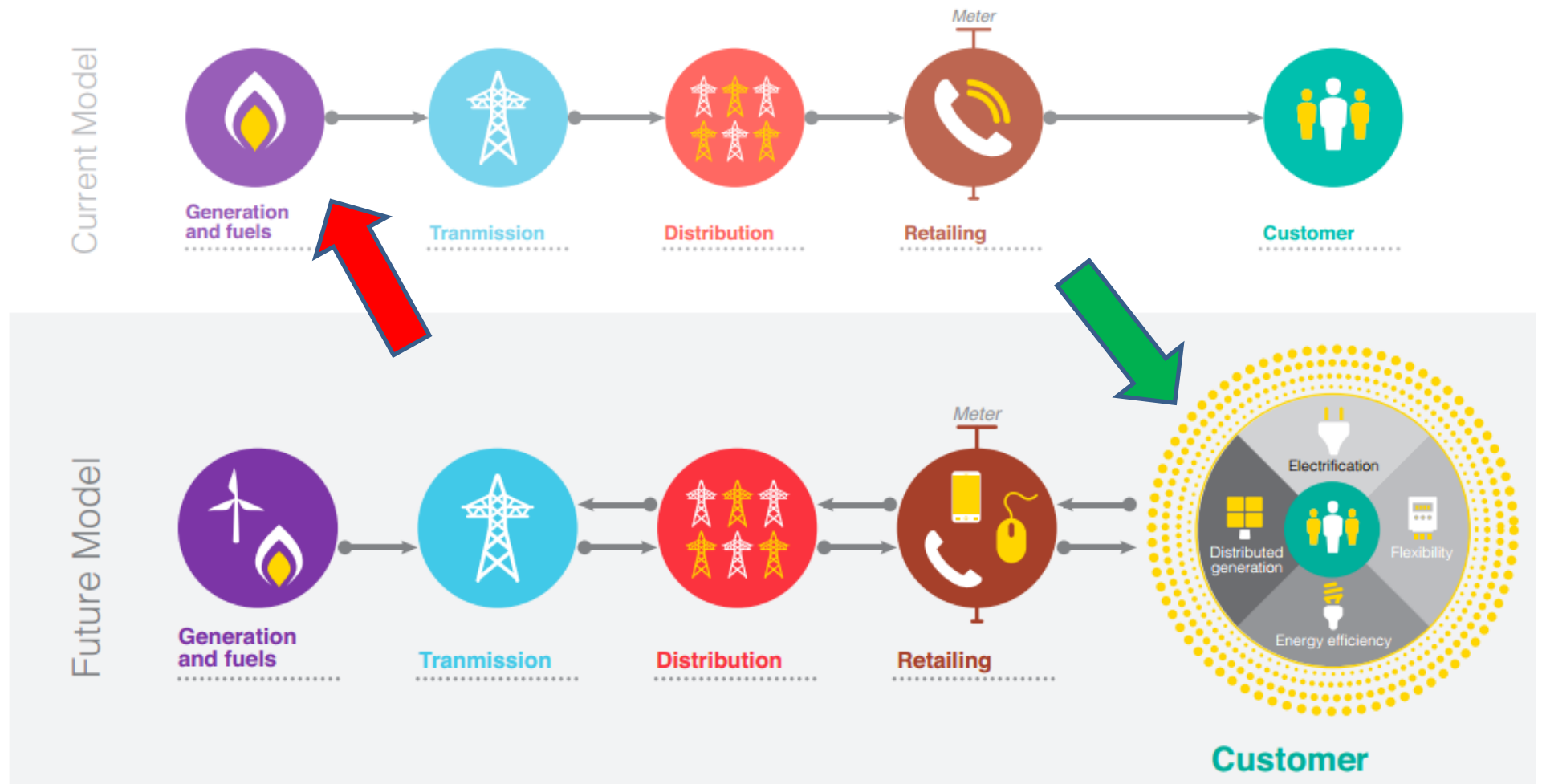


Source: [Energy Technology Perspectives 2014](#)

[http://www.iea.org/w/bookshop/472-Energy\\_Technology\\_Perspectives\\_2014](http://www.iea.org/w/bookshop/472-Energy_Technology_Perspectives_2014)

# Business is changing focus

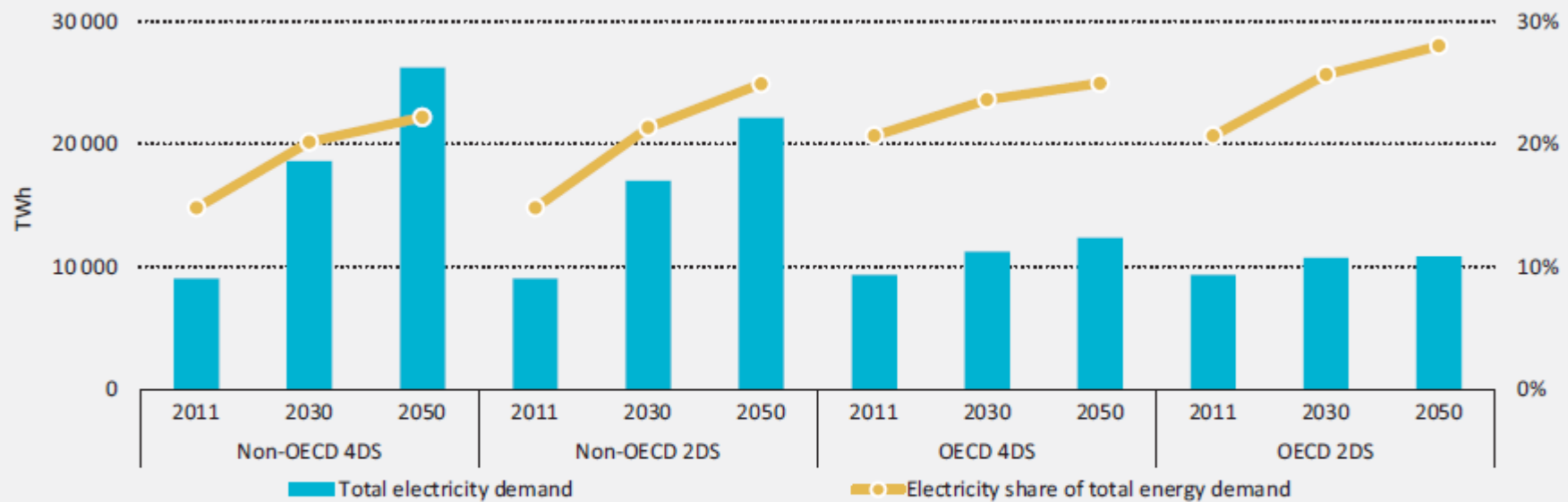
Figure 9: New business and investment opportunities are emerging close to the customer



# And a new focus on electricity

Figure I.1

Electricity demand and share of electricity

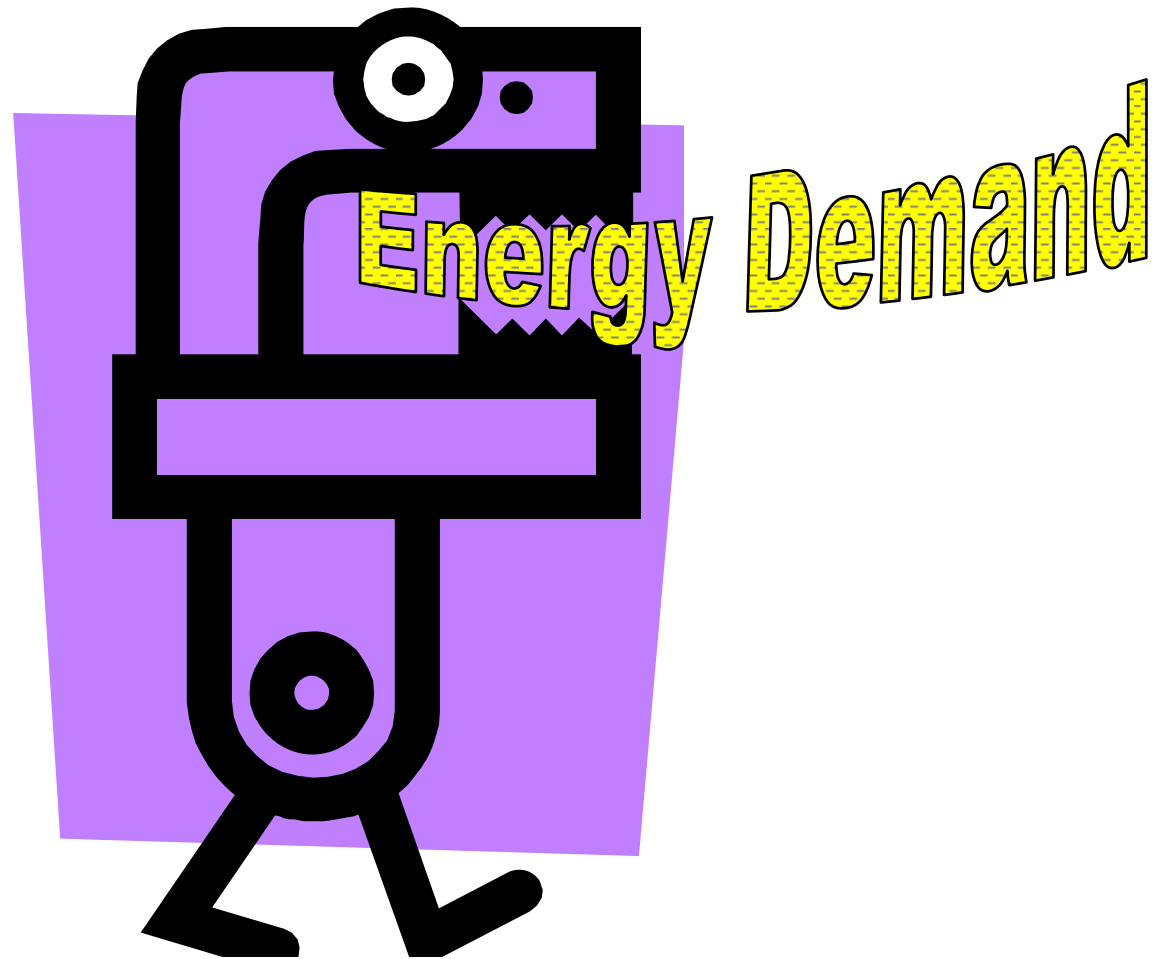


Notes: TWh = terawatt hours. Unless otherwise indicated, all tables and figures in this report derive from IEA data and analysis.

**Key point**

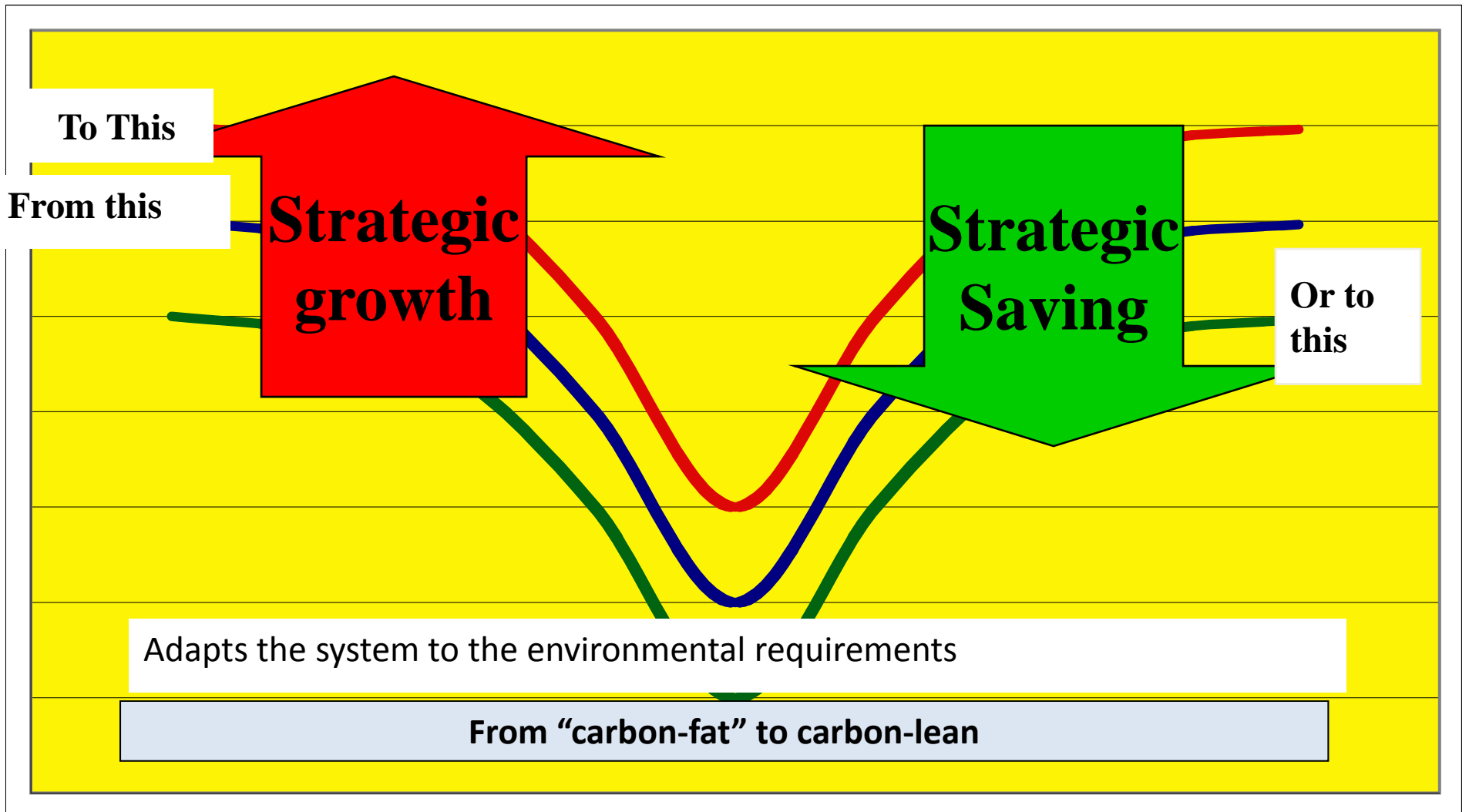
*Electricity demand growth differs between OECD and non-OECD countries, but the dominant trend is towards an increasing share of electricity in the overall energy mix.*

DSM is a tool to make large scale energy efficiency possible

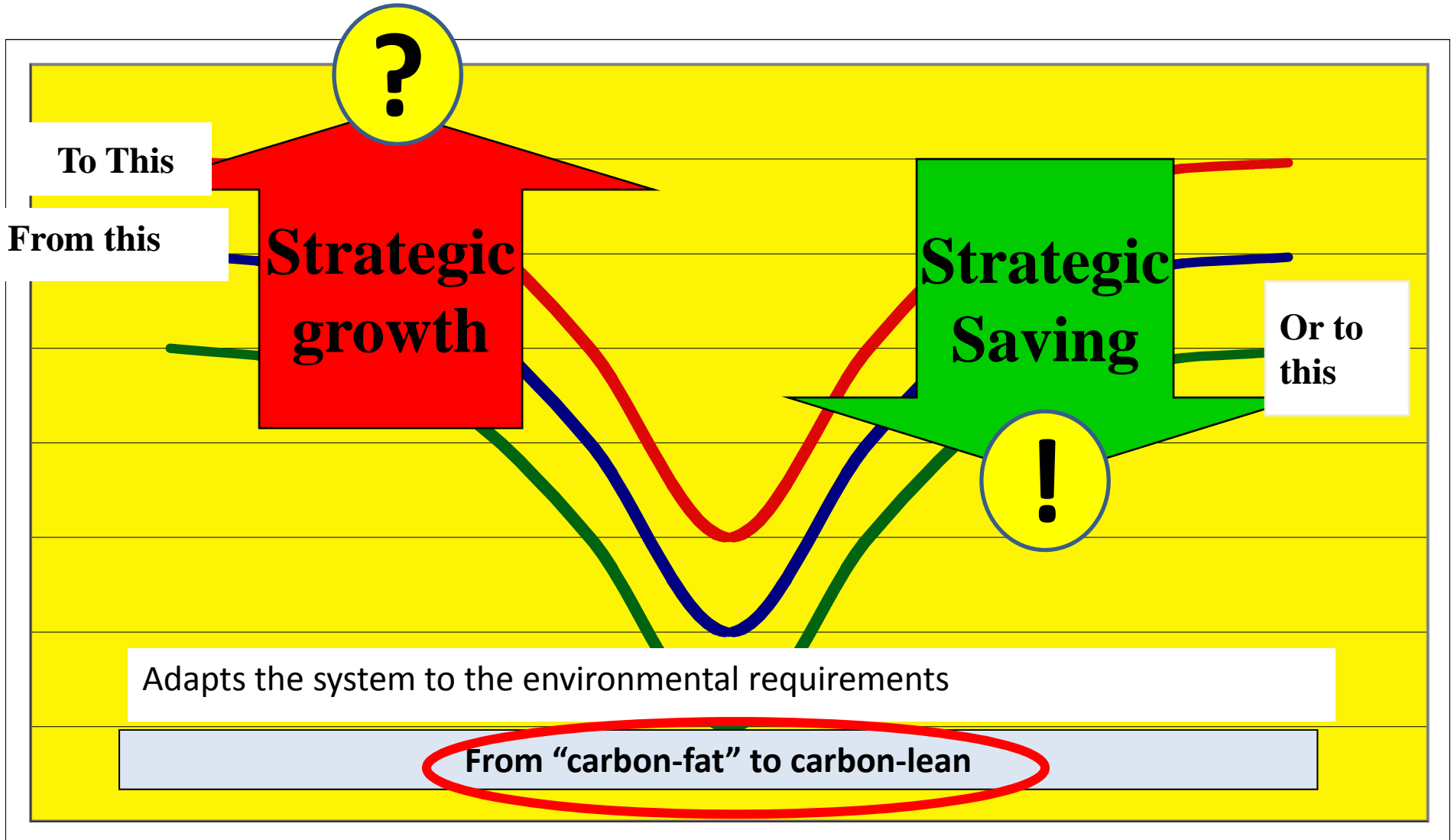




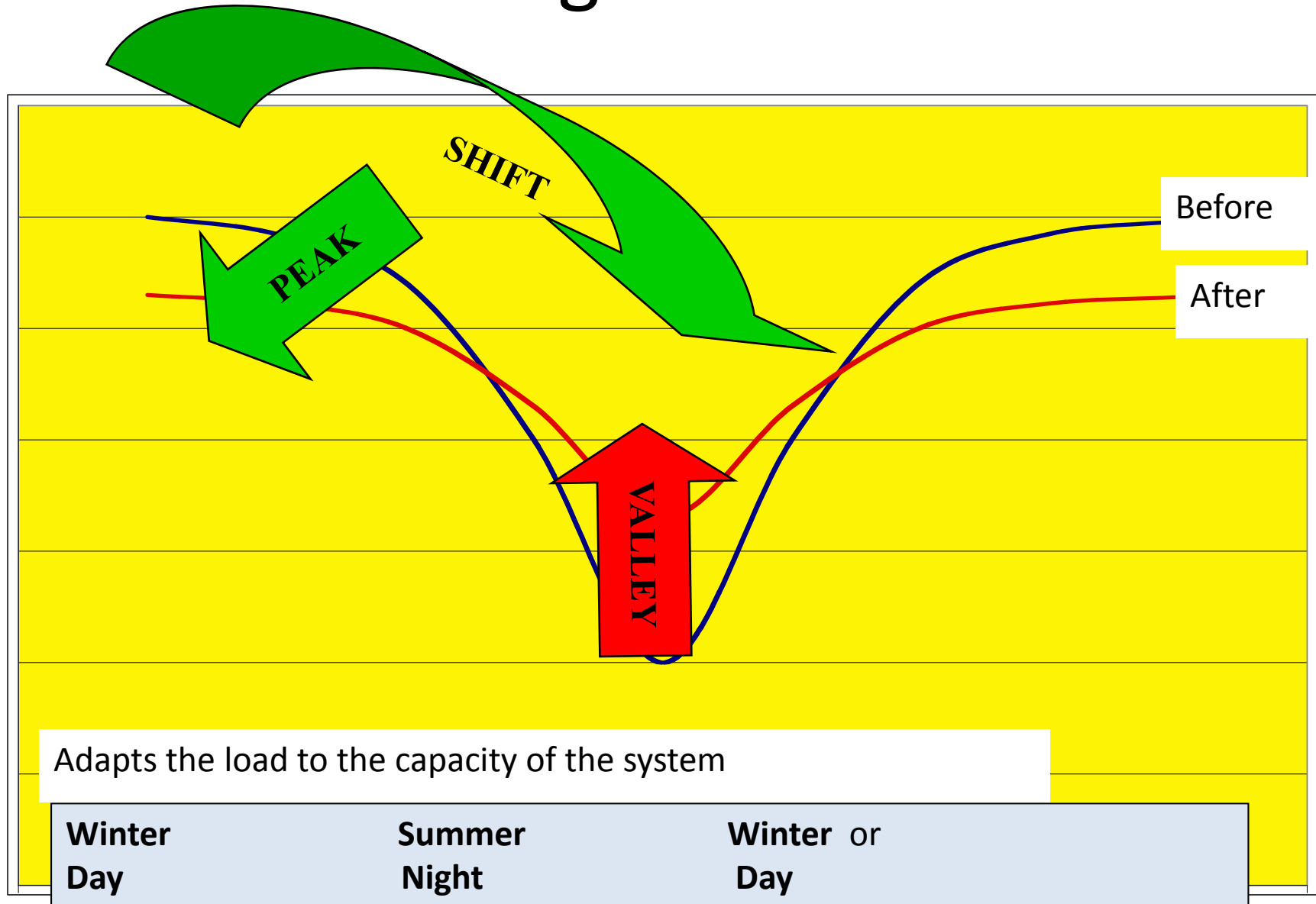
# DSM can change the LOAD LEVEL



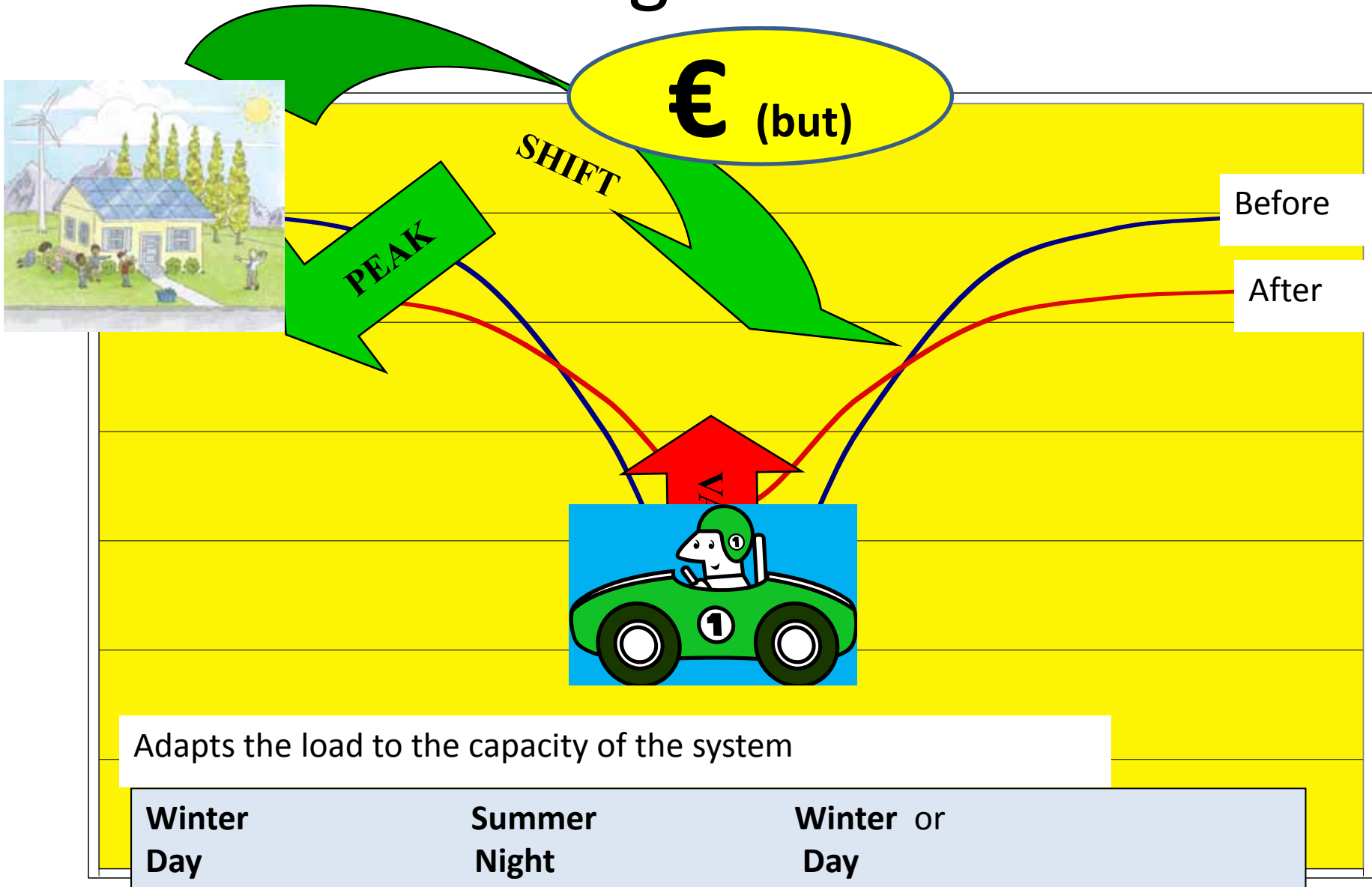
# DSM can change the LOAD LEVEL



# DSM can Change the LOAD SHAPE



# DSM can Change the LOAD SHAPE



# Change Agents (companies, intermediaries, catalysts)

| DSM-concept  |                      | Change agent role  | Example  |
|--|----------------------|--|--|
| Classic<br>(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 problem is not one but several!

- **Load level**
  - a wasteful demand requires too much supply for the specific needs (The customer do not need energy! He needs the service that energy, combined with an installation, provides)
- **Load shape**
  - high peaks,
  - little reserve capacity,
  - bottlenecks in transmission and distribution
- **Market responsibilities**
  - who is the owner of the problem?

# The DSM University ([www.dsmu.org](http://www.dsmu.org))

The screenshot shows a web browser window displaying the DSM University website. The browser's address bar shows the URL <http://www.leonardo-academy.org/cou>. The website's navigation menu includes links for HOME, MY LEARNING, APPRAISALS, FIND COURSES, and CALENDAR. The current page is titled "DSM University (beta)" and provides an overview of the program, including its purpose and two main clusters: the Load Shape Cluster and the Load Level Cluster. The page also features a navigation sidebar, a search forum, latest news, upcoming events, recent activity, and a list of participants.

HOME MY LEARNING APPRAISALS FIND COURSES CALENDAR

Home ▶ My courses ▶ Energy Efficiency ▶ DSMU

NAVIGATION

Home

- My learning
- Site pages
- My profile
- Current course
  - DSMU
    - Participants
    - Badges
    - DSM University (beta)
    - DSM Café
    - The logic of DSM
    - DSM Management
    - Energy use (load level)
    - Flexibility (load shape)
    - Integration
    - Business models
    - Feedback
    - Glossary
    - The DSM quiz
    - Sandpil Hans Nilsson
- My courses

ADMINISTRATION

- Course administration
  - Turn editing on
  - Edit settings
  - Competencies
  - Reminders

DSM University (beta)

What is DSM? In fact, it refers to all kinds of technological changes to the electrical system that originate from the demand side of the market. The purpose of DSM can be multifold, but large scale energy efficiency improvement is certainly a primary goal. The IEA's DSM Program structures its activities into two clusters, depending on the desired impact on the load curve of the energy system.

- The **Load Shape Cluster** includes tasks that aim to improve the shape of the load curve over short (minutes-hours-days) or longer (days-weeks-seasons) time periods. This will primarily increase the **reliability and operability of the system**, although it can also indirectly improve energy efficiency.
- The **Load Level Cluster** includes tasks that aim to lower demand levels; or shift the load from one energy system to another. This cluster primarily targets **energy efficiency improvement** and the reduction of Greenhouse Gas emissions, although it can also improve the reliability and operability of the system.

News forum

About the DSM University

DSM Café

Enter the virtual Café to discuss any issues related to DSM.

The café is governed by just a few common-sense rules:

- new members are invited to introduce themselves in the introduction forum
- posts need to be on the topic of DSM
- no ads or self-promotion. Relevant reports, events, news, ... are welcome in the 'what's happening in DSM' section of the café
- appropriate use of language
- English only

Introduce yourself

The logic of DSM

DSM Management

Energy use (load level)

Flexibility (load shape)

Integration

Business models

SEARCH FORUMS

Go

Advanced search

LATEST NEWS

Add a new topic...

30 Nov, 14:14

Hans De Keulenaer

Welcome to the DSM University (beta)

Older topics ...

UPCOMING EVENTS

There are no upcoming events

Go to calendar...

New event...

RECENT ACTIVITY

Activity since Monday, 17 February 2014, 10:16 AM

Full report of recent activity...

Nothing new since your last login

PEOPLE

Participants

100 %

# The Structure

**1. The Logic of DSM**, in which motivations and overview is presented in particular to decision makers and people who wants to see how issues connect to each other

- **Strategies for DSM**
  - **The role of Efficiency and flexibility in systems (IDSM)**
  - **Actors, and their roles/relations, to make DSM a reality**
  - **DSM potential and costs (including rebound)**
- 

**2. Governance (or DSM Management)**, in which incentives, cost/benefit, planning, evaluation and regulation are dealt with but also institutional behavioural issues such as barriers and biases.

- **Incentives (carrots and sticks)**
- **Evaluation**
- **The plethora of benefits (and for whom)**
- **Planning and regulation**
- **Barriers and biases**

Lecturers: 1) OAs or delegated experts, 2) Other authors, 3) Other IAs or IEA authors, 4) Persons with knowledge and perspectives



# Structure continued

**3. Energy use (Load Level)**, technologies and measures to promote load level changes including strategic shifts of energy use to reduce carbon emissions.

- **Obligations and certificates (applications and practice)**
  - **Network and grid issue**
  - **Equipment**
  - **Calculation**
  - **Business models**
- 

**4. Flexibility – (Load shape)**, technologies and applications in DR systems and as regards customer benefits and participation

- **Incentives (Pricing to reflect capacity needs)**
- **Demand response practices and market segments**
- **Technologies**
- **Market models**

# Structure continued

**5. Integration**, putting energy efficiency, storage and RES together to systems

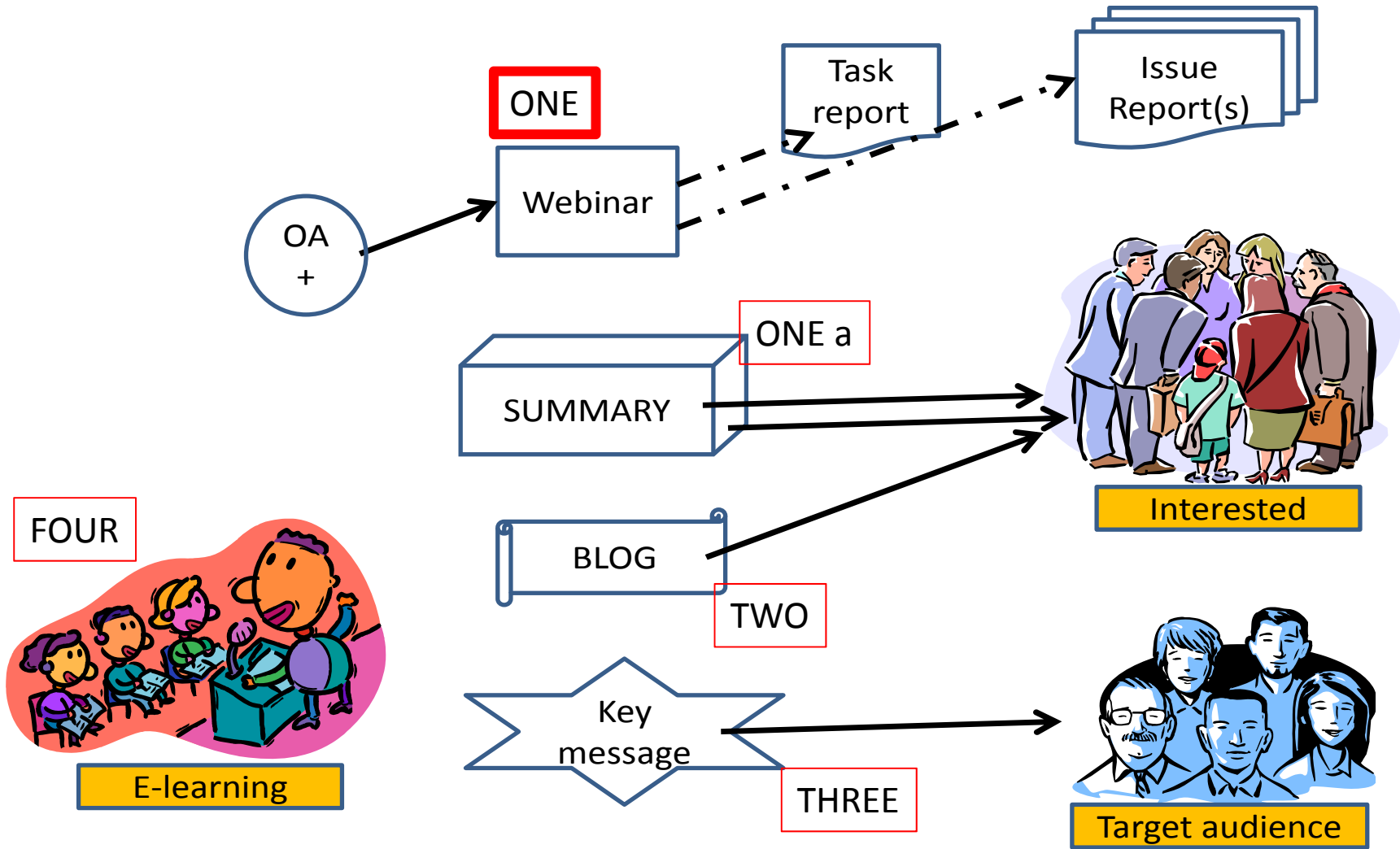
- **Preparing for integration**
- **Practical examples**
- **Incentives**



**6. Business models**, to deliver energy services

- **Empowering users**
- **ESCOs and EPCs**
- **Municipalities**
- **Market Transformation**

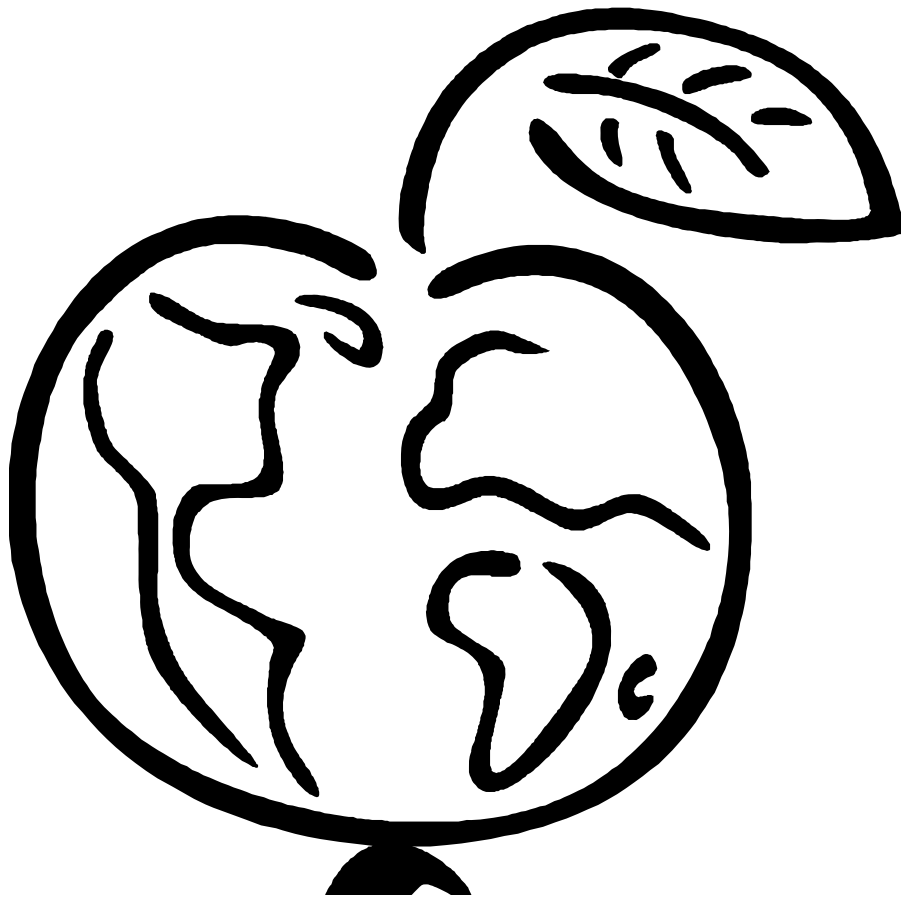
# PRODUCTS



|    |   |        |  |
|----|---|--------|--|
| 1  | <a href="#"><u>ESCo market development: A role for Facilitators to play</u></a>   | 16     | Jan Bleyl                                      |
| 2  | <a href="#"><u>ISGAN Annex 2 Spotlight on Demand Management</u></a>   | ISGAN  | Laura Marretta                                 |
| 3  | <a href="#"><u>Using Demand-Side Management to Support Electricity Grids</u></a>  | 15     | David Crossley (RAP)                           |
| 4  | <a href="#"><u>Best Practices in Designing and Implementing Energy Efficiency Obligation Schemes</u></a>                                    | 22     | David Crossley (RAP)                           |
| 5  | <a href="#"><u>Impact evaluation of Energy Efficiency and DSM programmes</u></a>  | 1/9    | Harry Vreuls                                   |
| 6  | <a href="#"><u>Managing Variability, Uncertainty and Flexibility in Power Grids with High Penetration of Renewables</u></a>                 | -      | Lawrence Jones, Alstom                         |
| 7  | <a href="#"><u>Customized, Systemic, Strategic – the way to succeed with energy efficiency in industry</u></a>                              | -      | Catherine Cooremans, Business School of Geneva |
| 8  | <a href="#"><u>Taking Stock – 40 years of Industrial Energy Audits</u></a>  | (ecee) | Peter Mallaburn, UCL                           |
| 9  | <a href="#"><u>Behavioural changes are necessary to get the full impact on energy efficiency. What works and what doesn't (part 1)</u></a>  | 24     | Ruth Mourik                                    |
| 10 | <a href="#"><u>How to make the best technology even better, BAT becomes BAT+</u></a>  | 3      | Hans Nilsson                                   |
| 11 | <a href="#"><u>Capturing the Multiple Benefits of Energy Efficiency</u></a>   | New    | Nina Campbell                                  |
| 12 | <a href="#"><u>Consequences of learning curves for energy policy</u></a>  | -      | Clas-Otto Wene                                 |
| 13 | <a href="#"><u>„Do not take away their steering wheel!“ How to achieve effective behavioural change in the transport and SME domain</u></a> | 24-2   | Ruth Mourik                                    |
| 14 | <a href="#"><u>Improving energy efficiency in SMEs – an interdisciplinary perspective</u></a>   | -      | Patrik Thollander                              |

**THE WEBINARS IS THE HEARTBEAT OF THE DSM UNIVERSITY**

Is sustainable growth possible...



..without DSM  
and without  
global co-  
operation?