

DSM

Enabler of the smart cities

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FourFact AB



SMART? (How, Who, For Whom)

smart ^ˈ (smärt)
adj. **smart-er, smart-est**



1.

- a. Characterized by sharp quick thought; bright. See Synonyms at [intelligent](#).
- b. Amusingly clever; witty: *a smart quip; a lively, smart conversation*.
- c. Impertinent; insolent: *That's enough of your smart talk.*



2. Energetic or quick in movement: *a smart pace.*

3. Canny and shrewd in dealings with others: *a smart negotiator.*

4. Fashionable; elegant: *a smart suit; a smart restaurant; the smart set.*

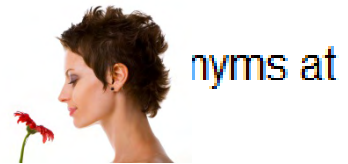
[fashionable](#).

5.

a. Capable of making adjustments that resemble human decisions, especially in response to changing circumstances: *smart missiles.*

b. Manufactured to regulate the amount of light transmitted in response to varying light conditions or to an electronic sensor or control unit: *smart windows.*

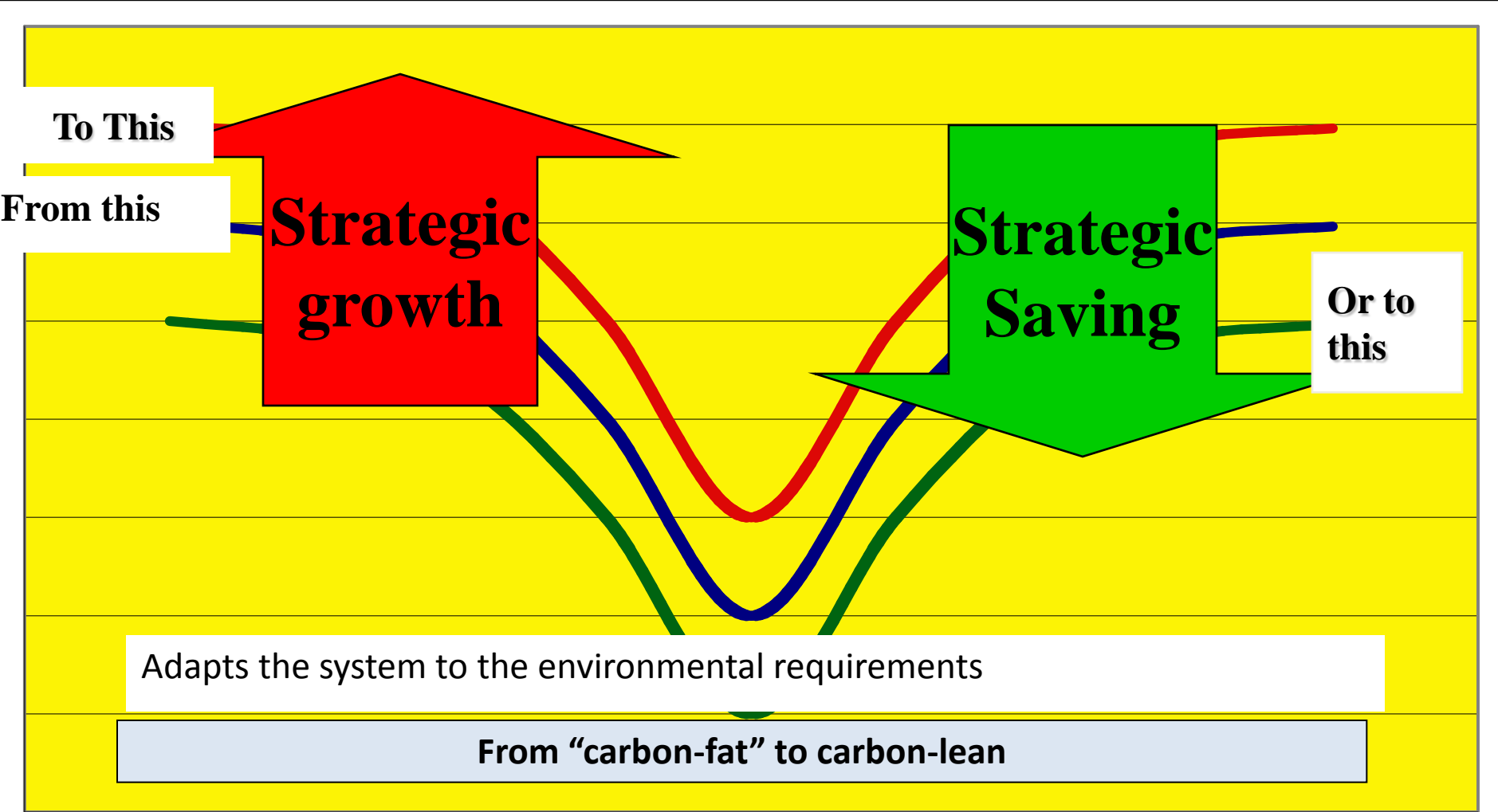
6. *New England & Southern U.S.* Accomplished; talented: *He's a right smart ball player.*



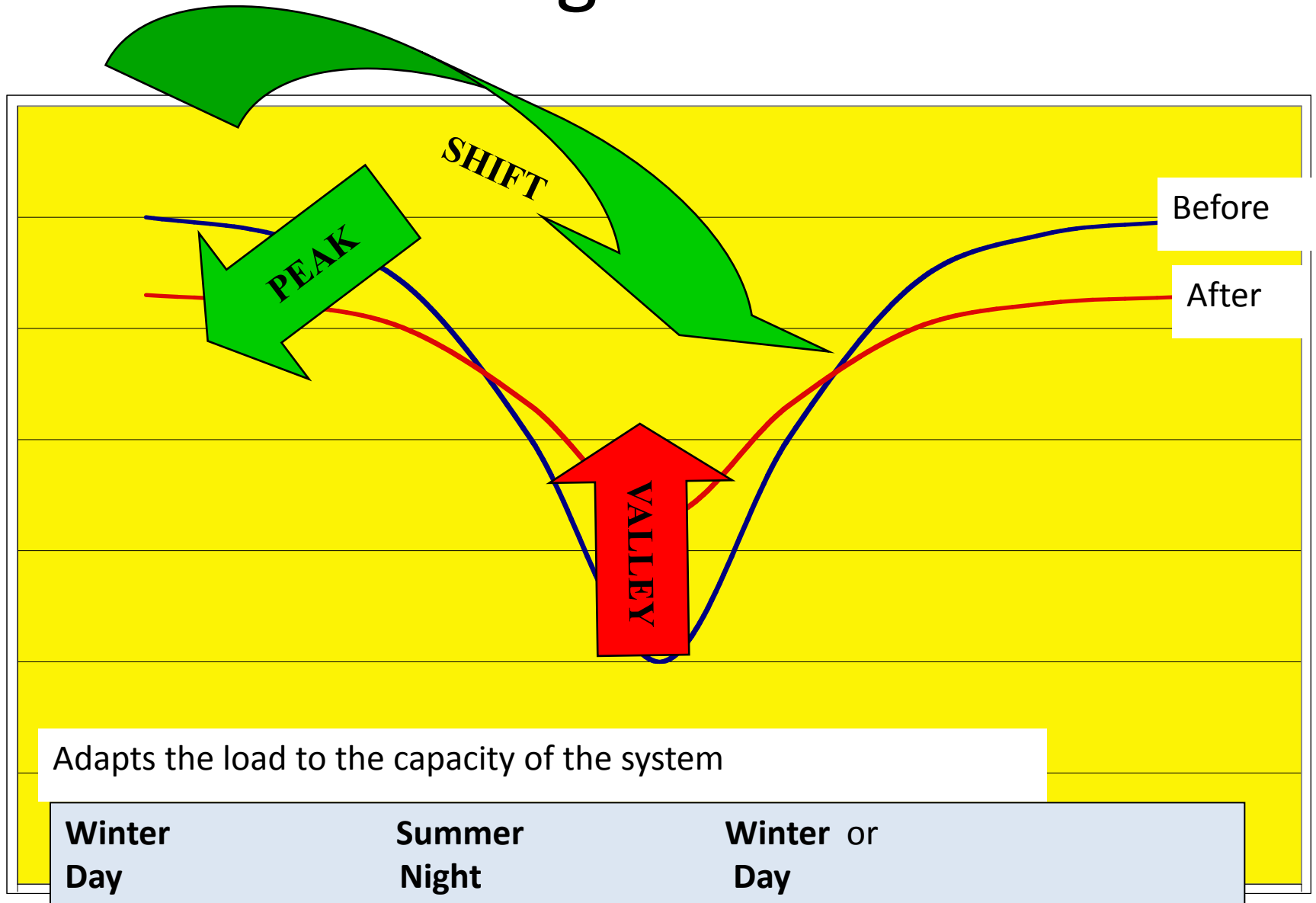
nyms at



DSM can change the LOAD LEVEL



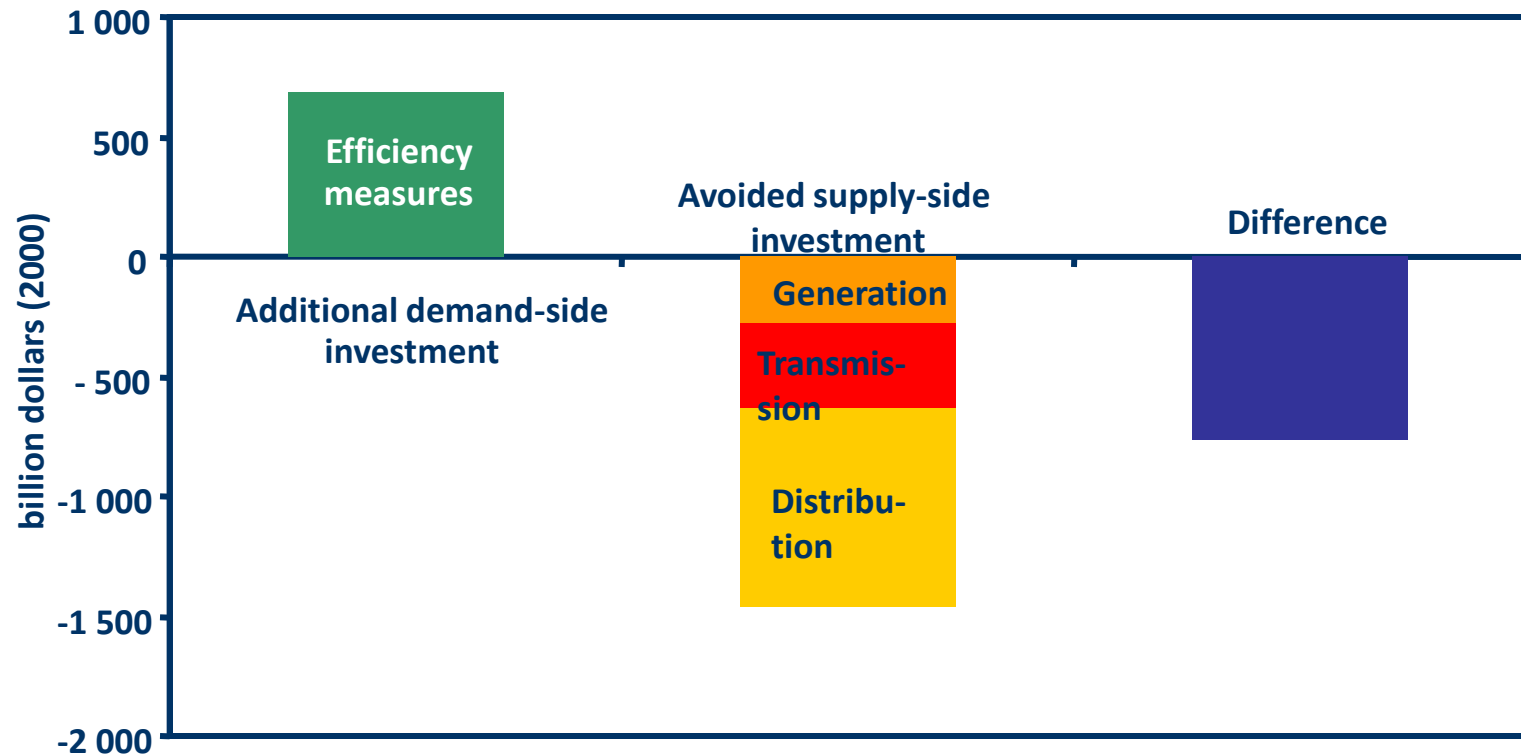
DSM can Change the LOAD SHAPE



The issues!

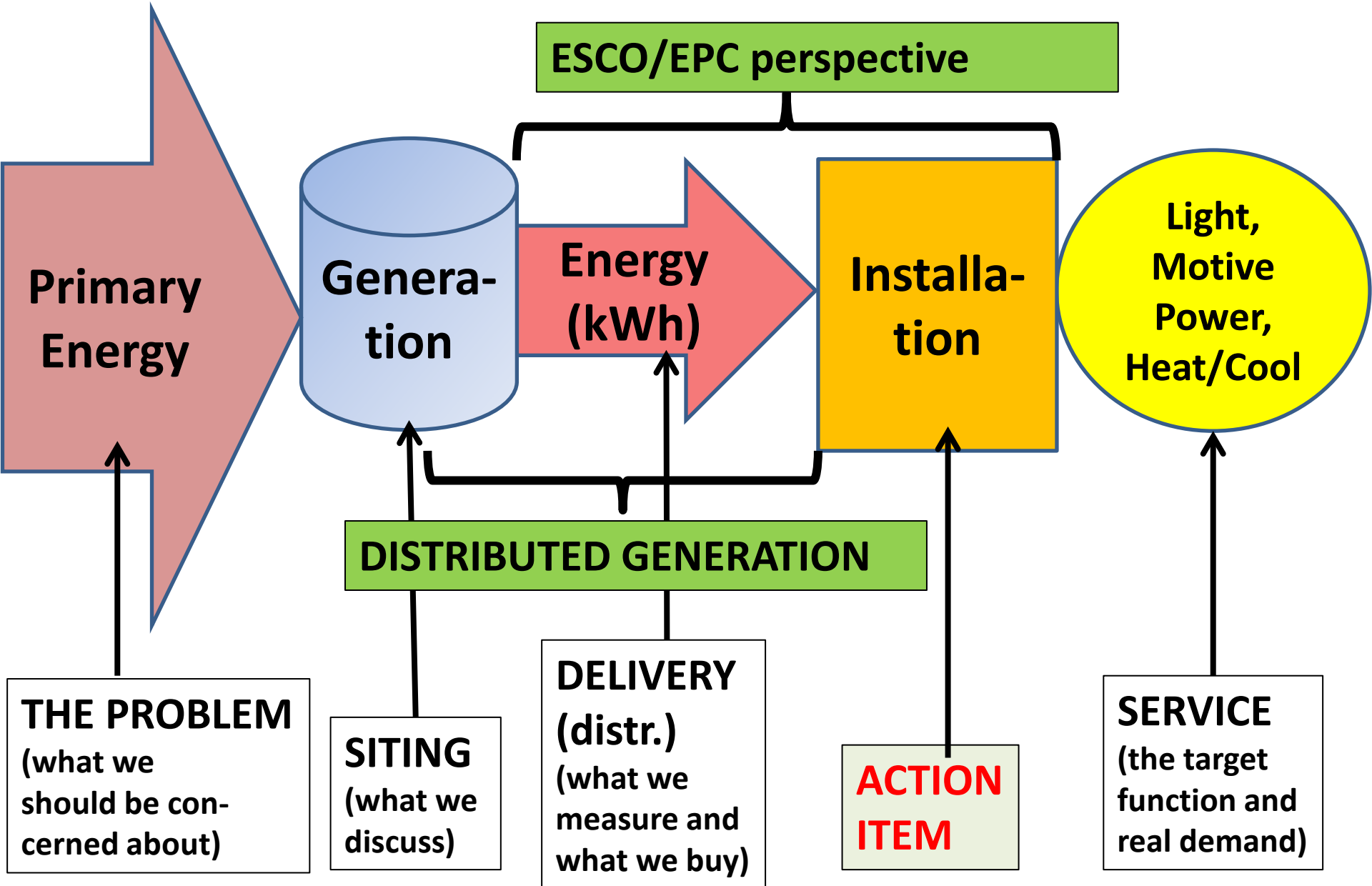
- **Load level**
 - a wasteful demand requires too much supply for the specific needs (The customer do not need energy! He needs the service that energy, combined with an installation, provides)
- **Load shape**
 - high peaks,
 - little reserve capacity,
 - bottlenecks in transmission and distribution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

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

Shifting the Focus in the Energy System



Energy or service?

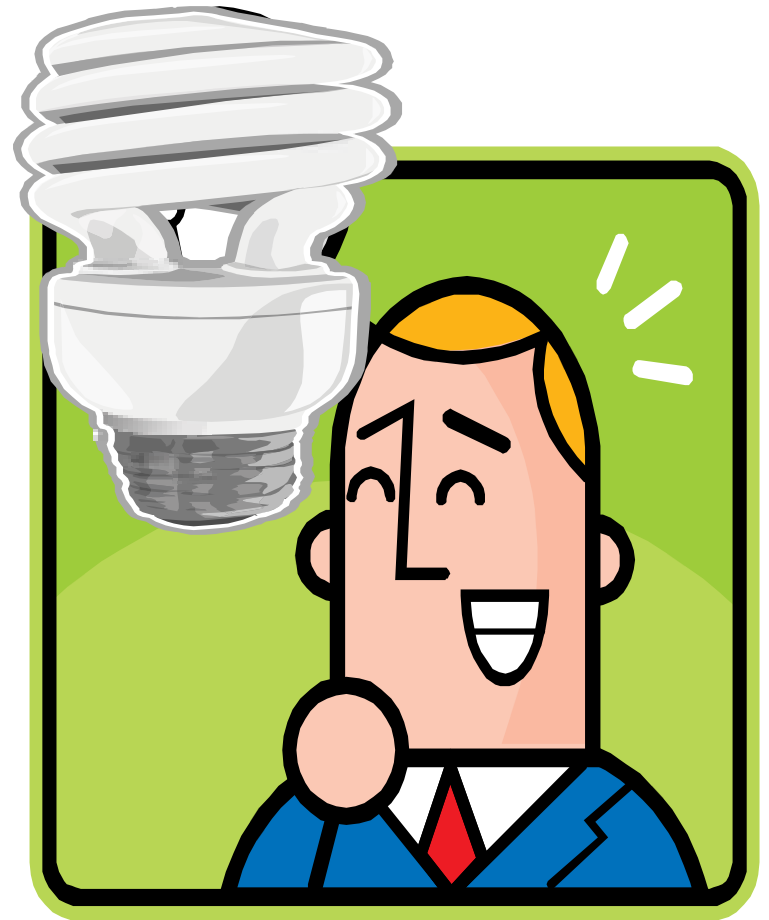
- Edison sold light-hours from his company "The Illuminating Comany", when he has invented the incansdescent lamp
- ..but JP Morgan divided the company into Edison Electric on one hand that sold energy and General Electric on the other that sold equipment



Source: <http://thesolutionsjournal.com/node/750> och "Technological Roulette a multidiciplinary study of innovation"

Energy services are smart

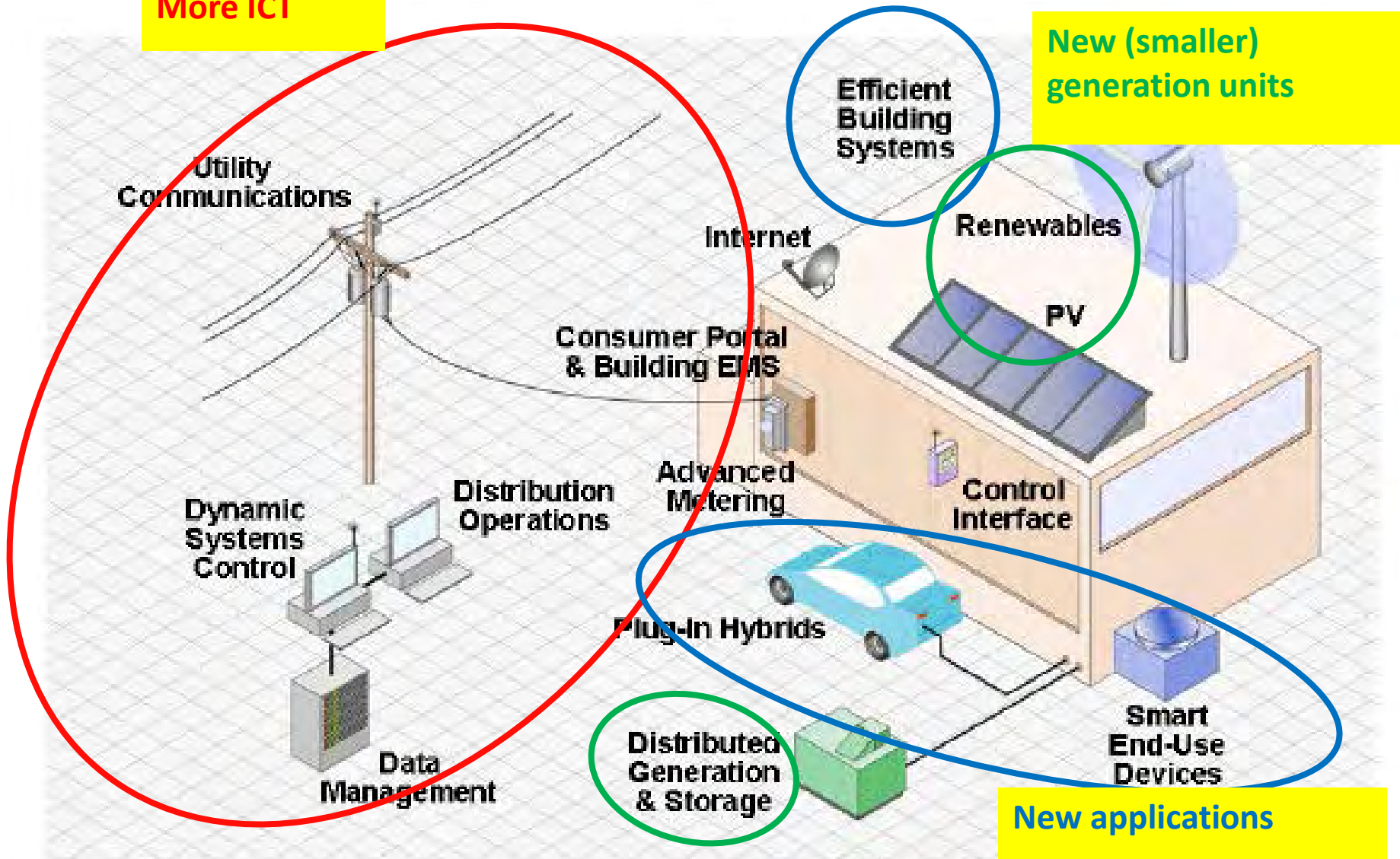
- ...power companies would have a strong incentive to develop and market efficient new technologies.
- Utilities inevitably would get into the business of selling or leasing such technologies
- The recent emergence of the “smart grid” —makes the energy-services model both possible and compelling.



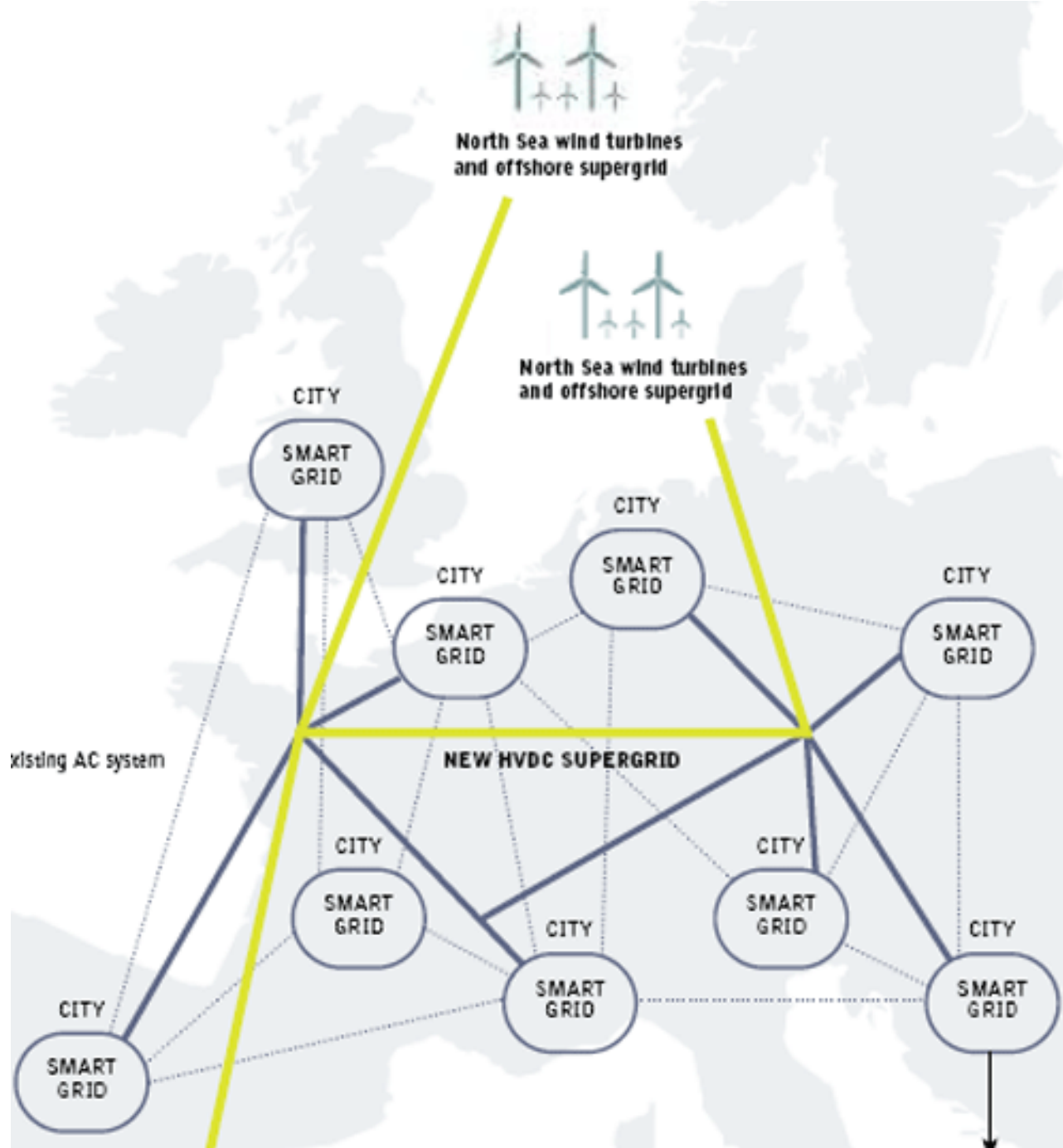
New Technologies

More ICT

New (smaller) generation units



European
context:
Super
grids
connected
to smart
grids

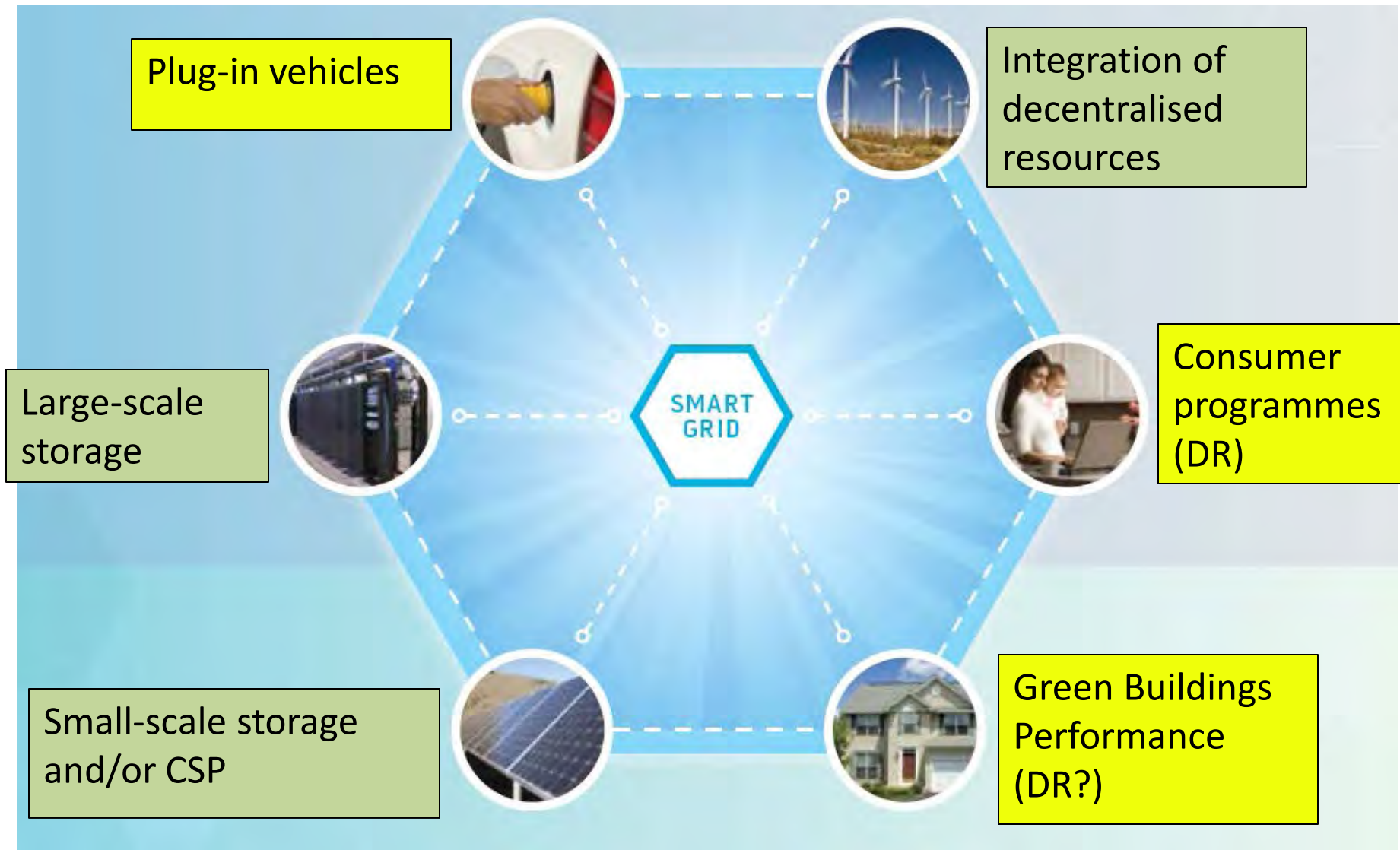


Future Businessorganisation - Two extremes and One thrust

- **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 and integrated in the business to deliver services in accordance with needs/demand and regulations)

- **Decentralised power** in smart grids

Smart Grid in a resource context



Smart Grid in a CUSTOMER context

Plug-in vehicles

Cool, Fancy, or?

Integration of decentralised resources

Own generation?

Large-scale storage

Consumer programmes (DR)

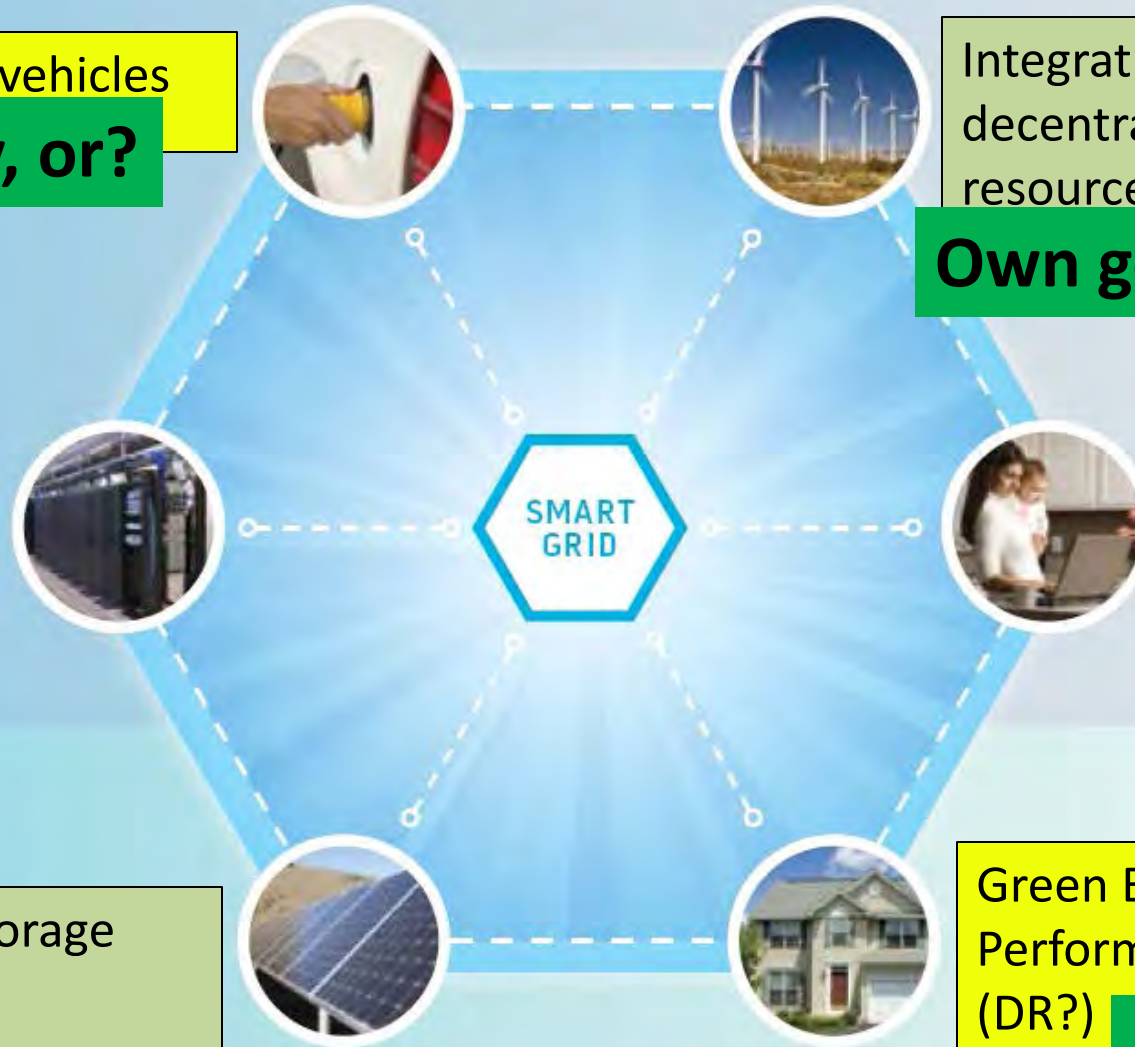


WHAT?

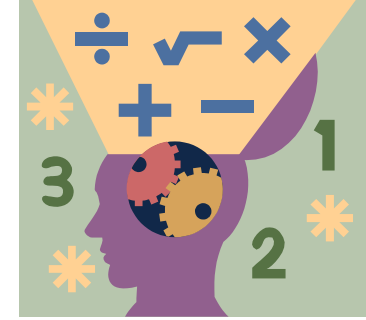
Small-scale storage and/or CSP

Green Buildings Performance (DR?)

Functions?



Perspectives on the market



Standard (Neo)-classical model ECONS

- Preferences are constant
- The prices contains the necessary information
- Customers have access to all necessary information on performance and prices

Good model to estimate the potential

Behavioural economics model HUMANS

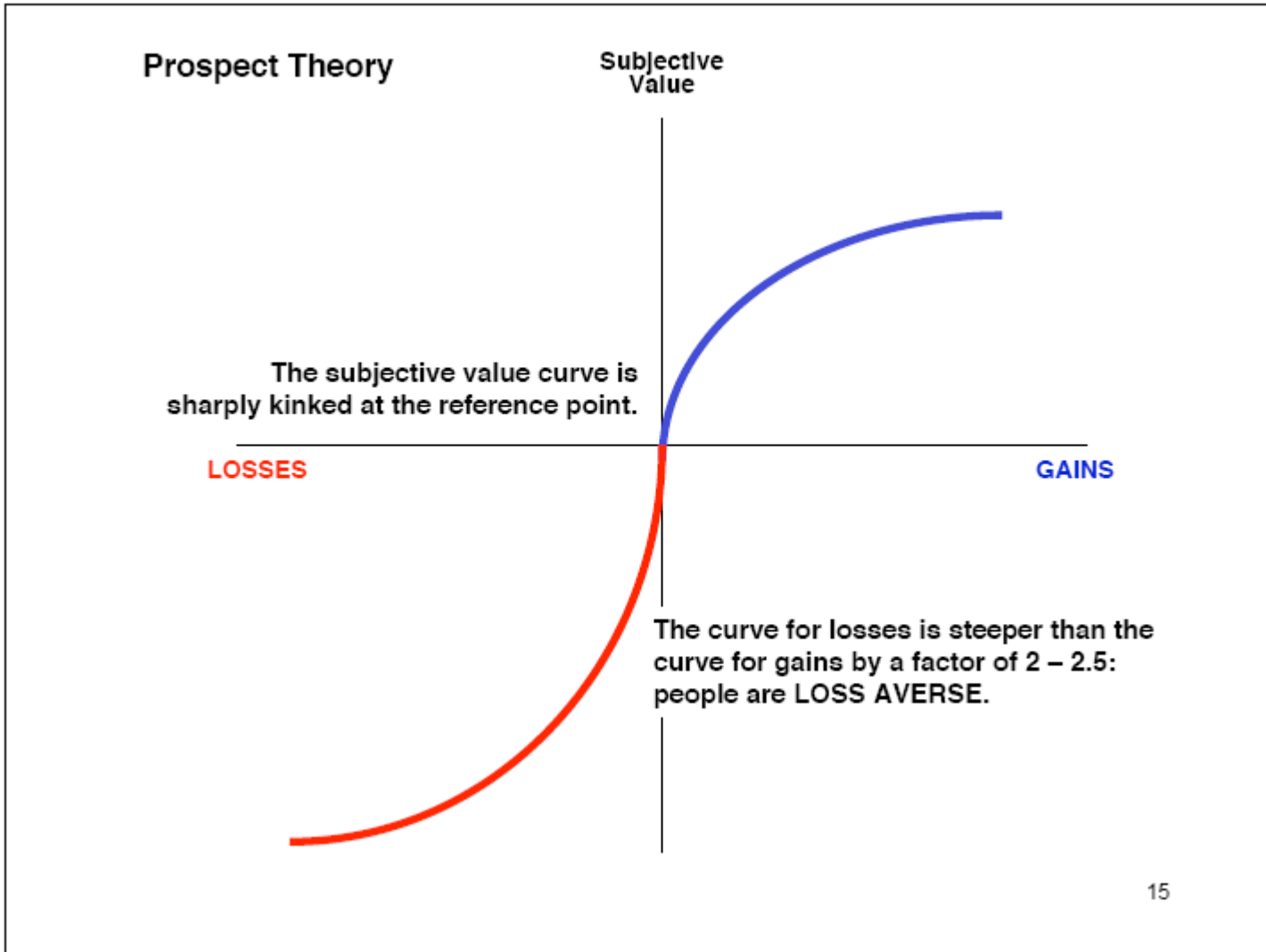
- Preferences are changing
- Decisions are biased by the way we are treating information
- Offers need to be designed (choice architecture)

Necessary to decide on policies for implementation

Mental accounting.

- **Representativeness:** People have a misconception of Chance. They see a 'normal' event and think it 'rare' and vice versa
- **Availability:** People tend to be biased by information that is easier to recall
- **Anchoring and Adjustment:** People are influenced by an initial anchor value that may be unreliable and irrelevant, and adjustment is often insufficient. People form initial impressions that persist and are hard to change

Winning < Loosing.



Choice architecture

- **iNcentives** (who pays/chooses-pays/profits); **what does changing of the thermostat yield?**
- **Understand mapping** (Choices related to welfare); **Illustrate consequences or “try free for X months”**
- **Default** (Opt-in or opt-out); **computer screen-saver**
- **Give feedback** (Understand function); **Plug-out sign or warning lamps**
- **Expect errors** (Foolproof?); **example insert a card 4-ways**
- **Structure complex choices** (Filtering); **Models and features**



Framing of the offers

Business interest in DSM

| Status of Task | Peak Load | Load Level | |
|--|--|--|--|
| <p>Past, Present and Future IEA DSM-Programme tasks</p> <p>Further information on the activities can be found at www.ieadsm.org .</p> | <p>Completed</p> | <p>Task II: Communications Technologies for Demand-Side Management</p> <p>Task VIII: Demand-Side Bidding in a Competitive Electricity Market</p> <p>Task XI: Time of Use Pricing and Energy Use for Demand Management Delivery</p> <p>Task XIII: Demand Response Resources</p> <p>Task XV: Network-driven DSM</p> <p>Task XIX: Micro Demand Response and Energy Saving</p> | |
| | <p>Current</p> | <p>Task XVII: Integration of Demand Side Management, Energy Efficiency, Distributed Generation and Renewable Energy Sources</p> <p>Task XXIII: The Role of Customers in Delivering Effective Smart Grids</p> | <p>Task I: Subtask 9 – Evaluation Guidebook on the impact of DSM and Energy Efficiency Programmes</p> <p>Task III: Technology procurement</p> <p>Task V: Marketing of Energy Efficiency</p> <p>Task VI: Mechanisms for Promoting DSM and Energy Efficiency in Changing Electricity Businesses</p> <p>Task VII: Market Transformation</p> <p>Task IX: The Role of Municipalities in a Liberalised System</p> <p>Task X: Performance Contracting</p> <p>Task XIV: Market Mechanisms for White Certificates Trading</p> <p>Task XVIII: Demand Side Management and Climate Change</p> |
| | <p>Task XXIV: Closing the loop - Behaviour change in DSM, from theory to policies and practice</p> | | |

*** DSM-university**

DSM can change the LOAD LEVEL

?

To This

From this

Strategic
growth

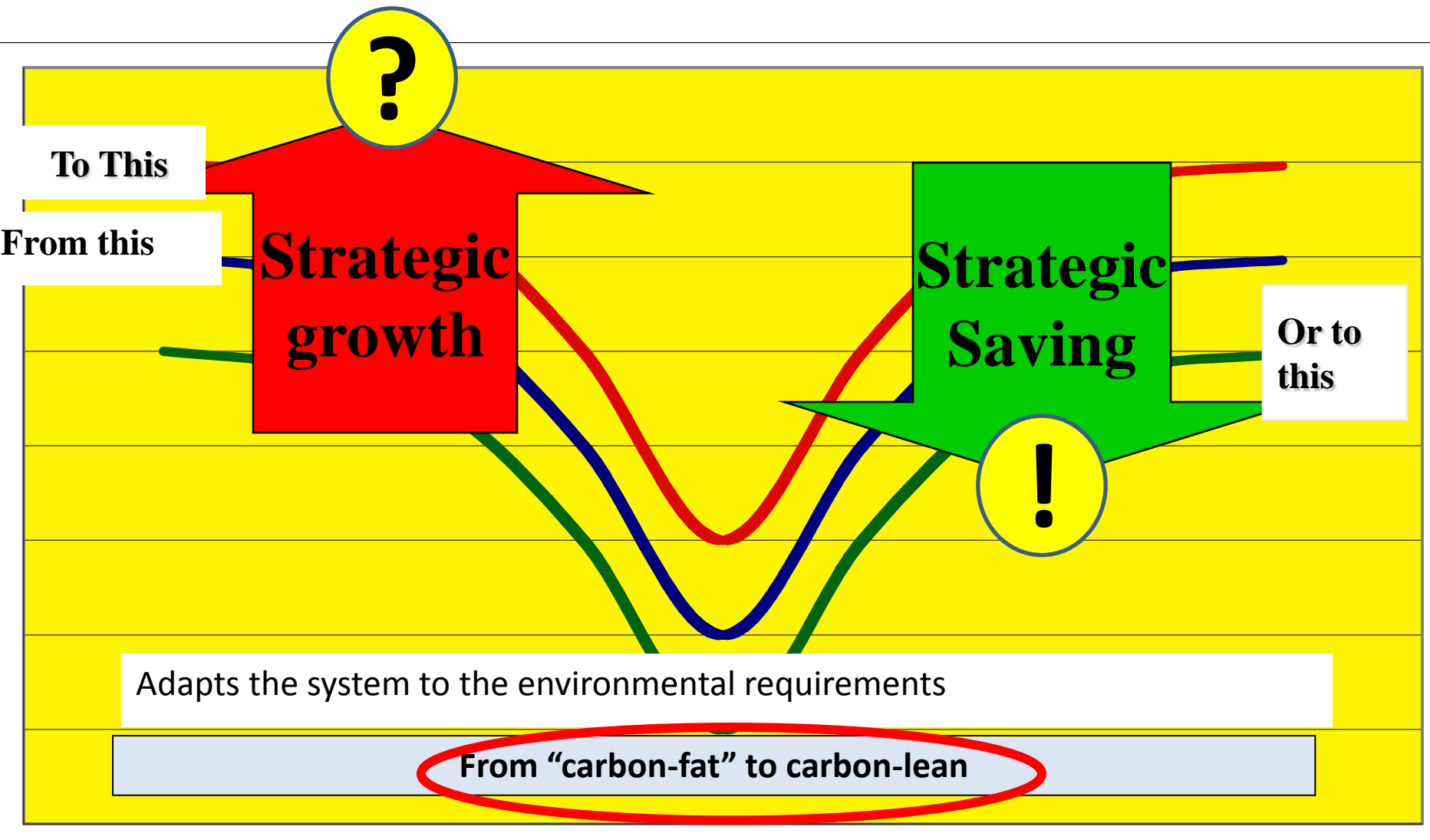
Strategic
Saving

Or to
this

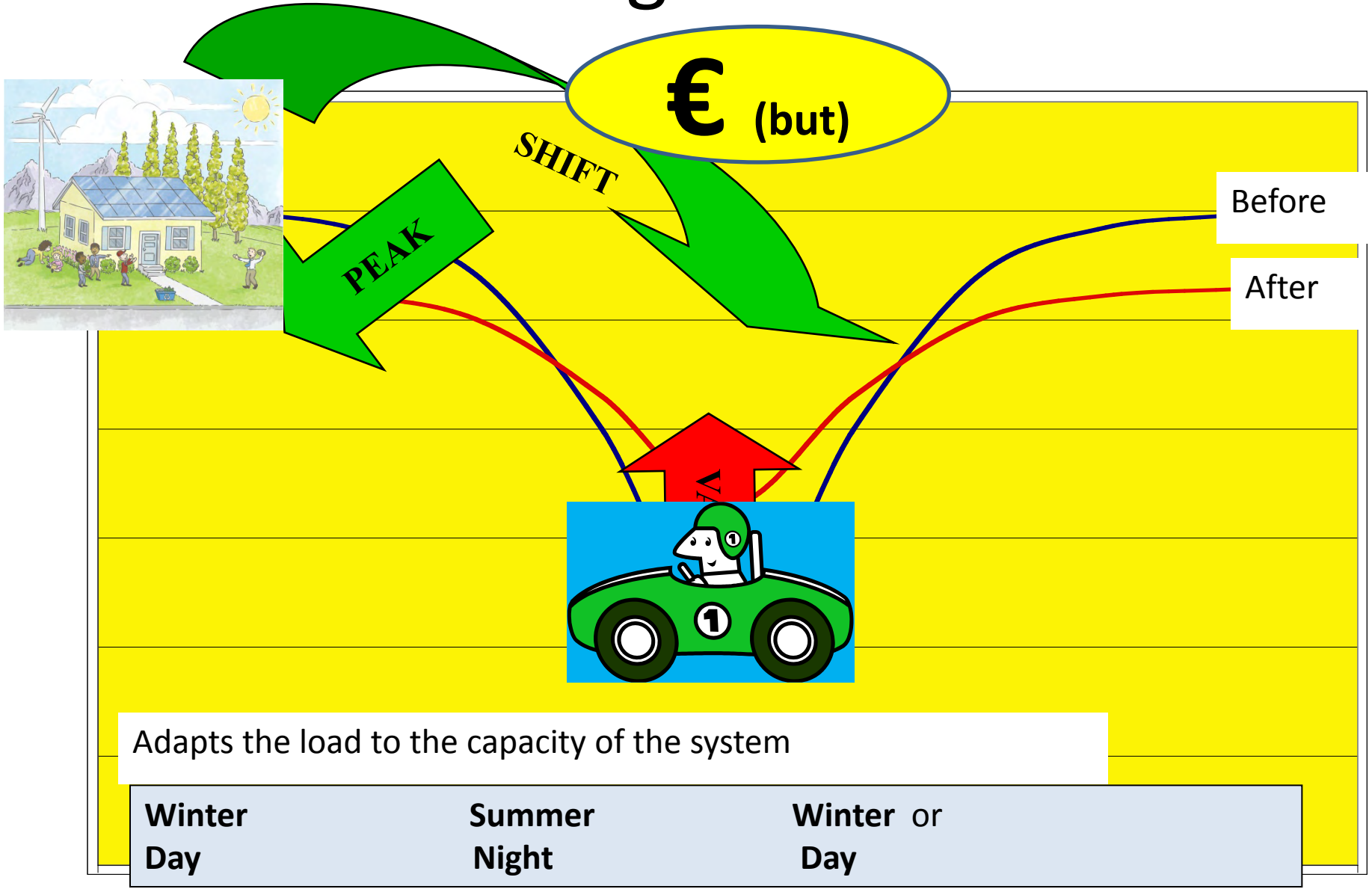
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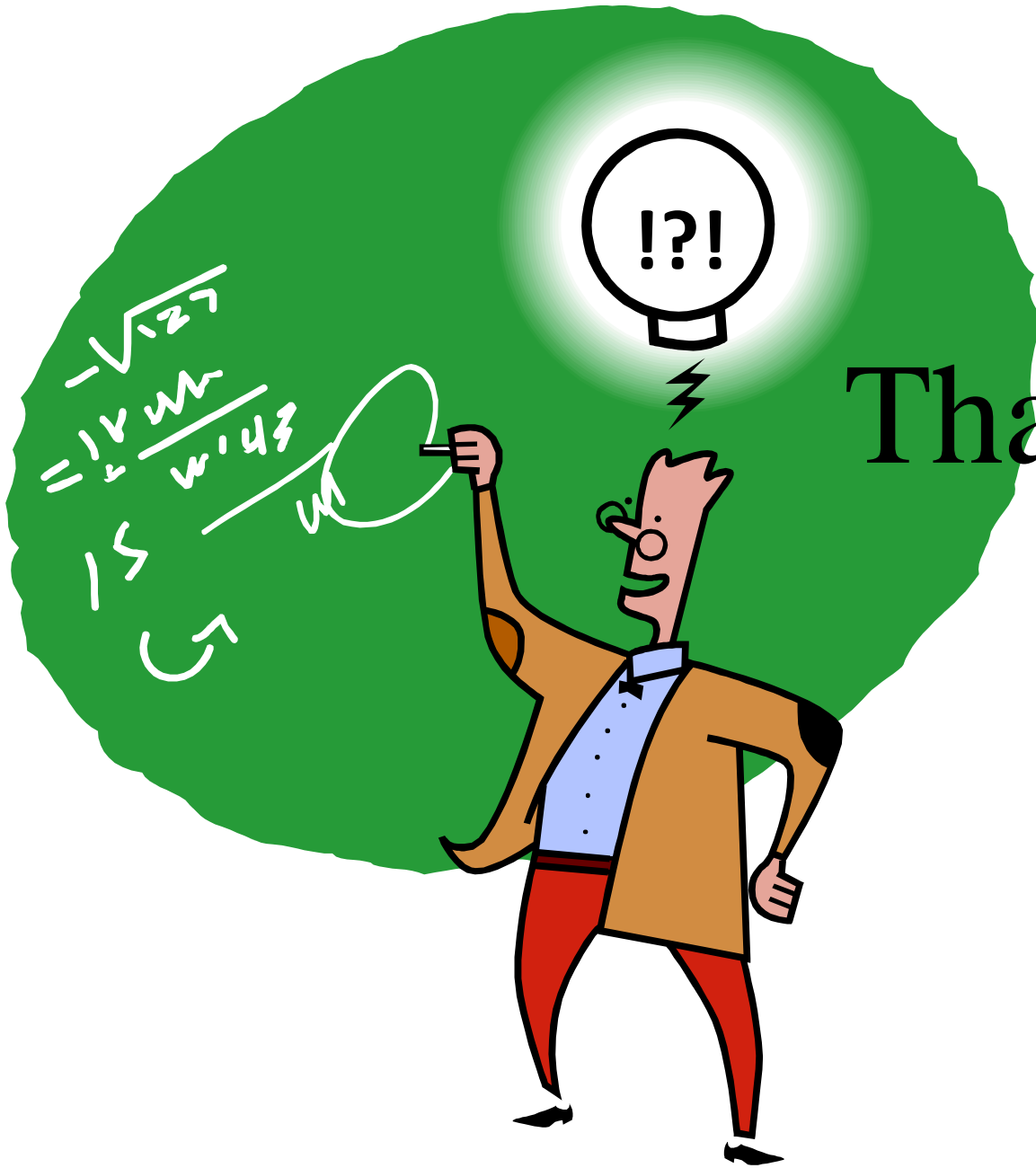
Adapts the system to the environmental requirements

From "carbon-fat" to carbon-lean



DSM can Change the LOAD SHAPE





Thanks folks!

The return of energy services

“Most managers have learned from experience, as Edison did, that a product should be packaged in a form which people can easily relate to,..... Most people cannot understand typical energy terms like kilowatts, kilowatthours.... They can relate to a heated room and a lighted desk.”



* "Energy House Call" is a registered trademark of the Potomac Energy Group, Inc.