



Future-proof regulation for a smart energy system

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THE BOSTON CONSULTING GROUP

Future-proof regulation in European energy?

Set a clear vision, being candid on trade-offs
(we can't have it all!)

$\frac{3}{5}$

$\frac{5}{20}$

Thought through policy measures that lead to this vision
AND articulate together

$\frac{0}{5}$

Set of policies that make business sense – for Europe/countries,
and for companies that we want to operate in energy

$\frac{2}{5}$

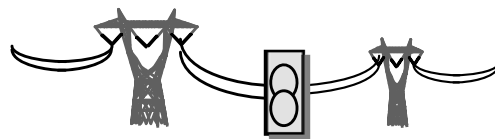
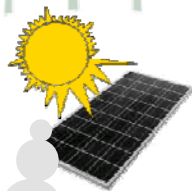
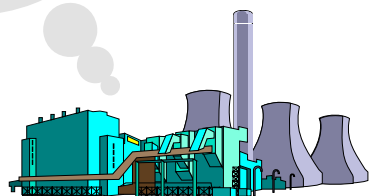
Stability of regulation, in line with long investment horizons,
and as simple as possible set of rules

$\frac{0}{5}$

Result: anxiety across the board

*Let's dismantle this CCGT...
... and wait for subsidies
to build a new one*

*Do they really think I can increase my
costs (capacity) with flat or decreasing
revenues (commodity)? Am I the next one
to build stranded assets?*



*Will prices stop
increasing?
Why do I need to
pay for my
neighbor's solar
panels?*

*If I have to enter the merchant
market one day, I'm dead!
How can I be sure they will not change
the rules of the game again?*

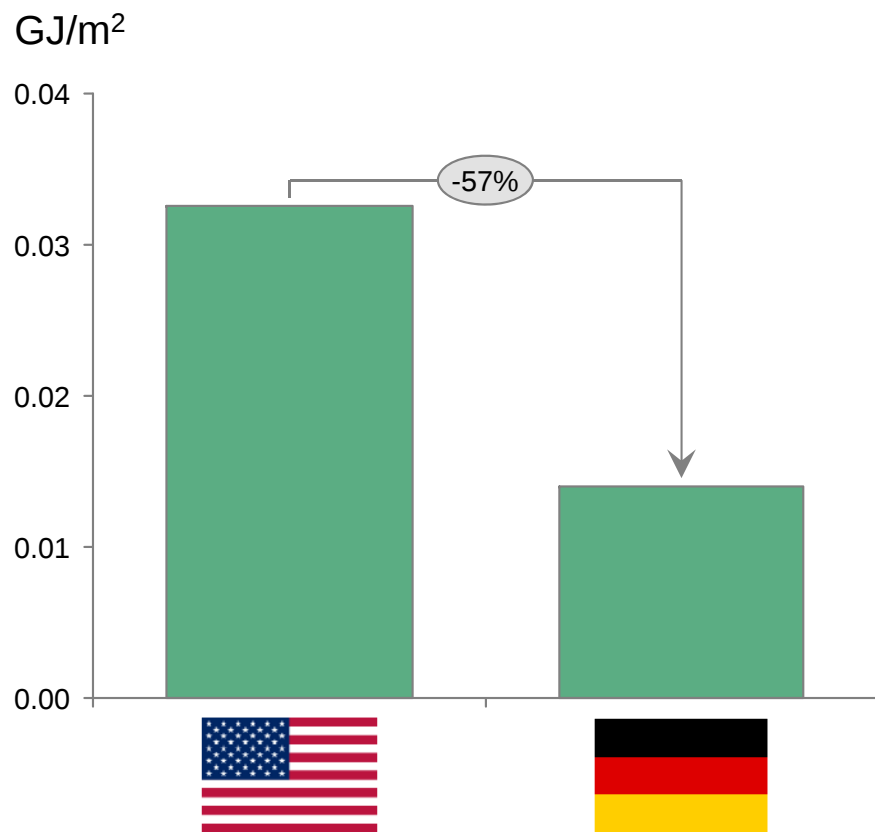
*Who can explain my customers
that I'm only responsible
for 10% of their bill?*

So what for a "*SMART*" energy system?

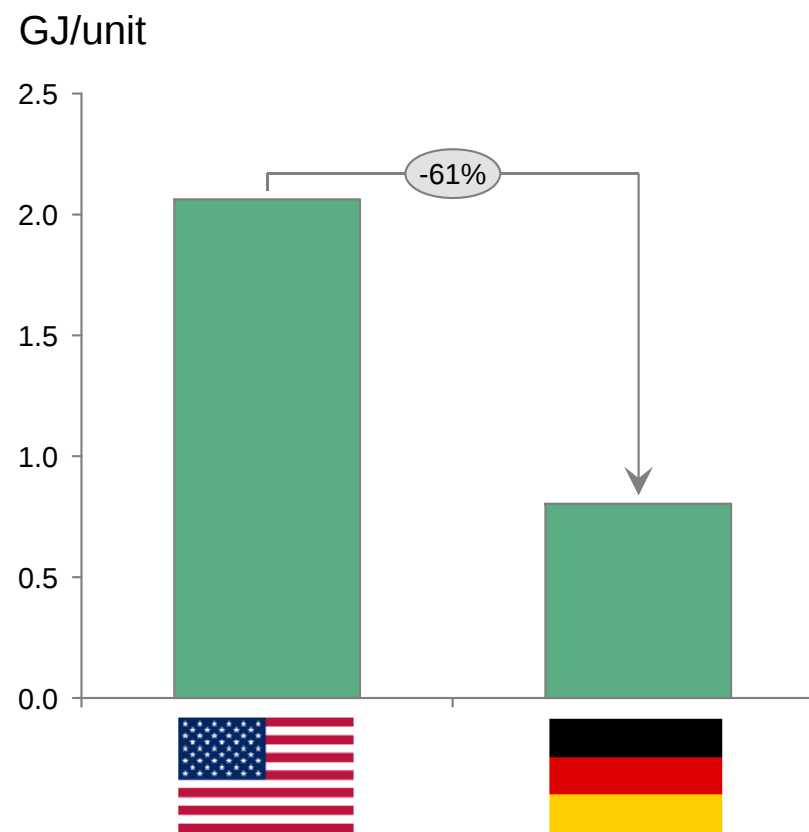
- 1 | Clear regulation promoting (or enforcing?) energy efficiency

What if the US was as energy efficient as Germany?

Residential lighting (2012)



Large home appliances (2012)

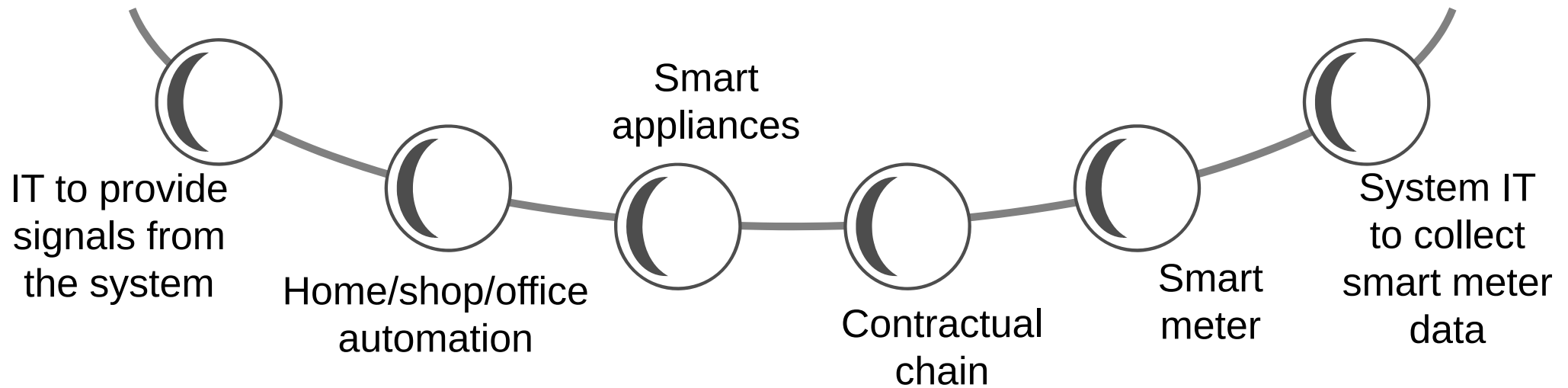


230+ TWh saved (>40 coal power plants)

So what for a "*SMART*" energy system?

- 1 | Clear regulation promoting (or enforcing?) energy efficiency
- 2 | Electrification of transport (and heating)
- 3 | Decentralized power production and balancing, implying innovation and entrepreneurship

Will the demand-side-response "necklace" have any value before all the pearls are on?



Who will invest in each pearl?
How will the value of the necklace be shared?
... and when?

Let's not under-estimate human ingenuity

Technology innovation

Illustration:

**blockchain reducing
substantially transaction costs
of demand-side response**

Business innovation

Illustration:

**start-ups installing connected
devices at customer premises
and contracting flexibility
services directly with TSO**

We need a regulation that will preserve innovation

So what for a "*SMART*" energy system?

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- 4 | No hidden subsidies



Solar power today benefits from (at least) two subsidies

Grid Sourcing

Feed-in tariffs



Source: BCG analysis.

Based on feed-in tariff of USD 13.5 c/kWh, the price for excess solar power sold back to the grid.

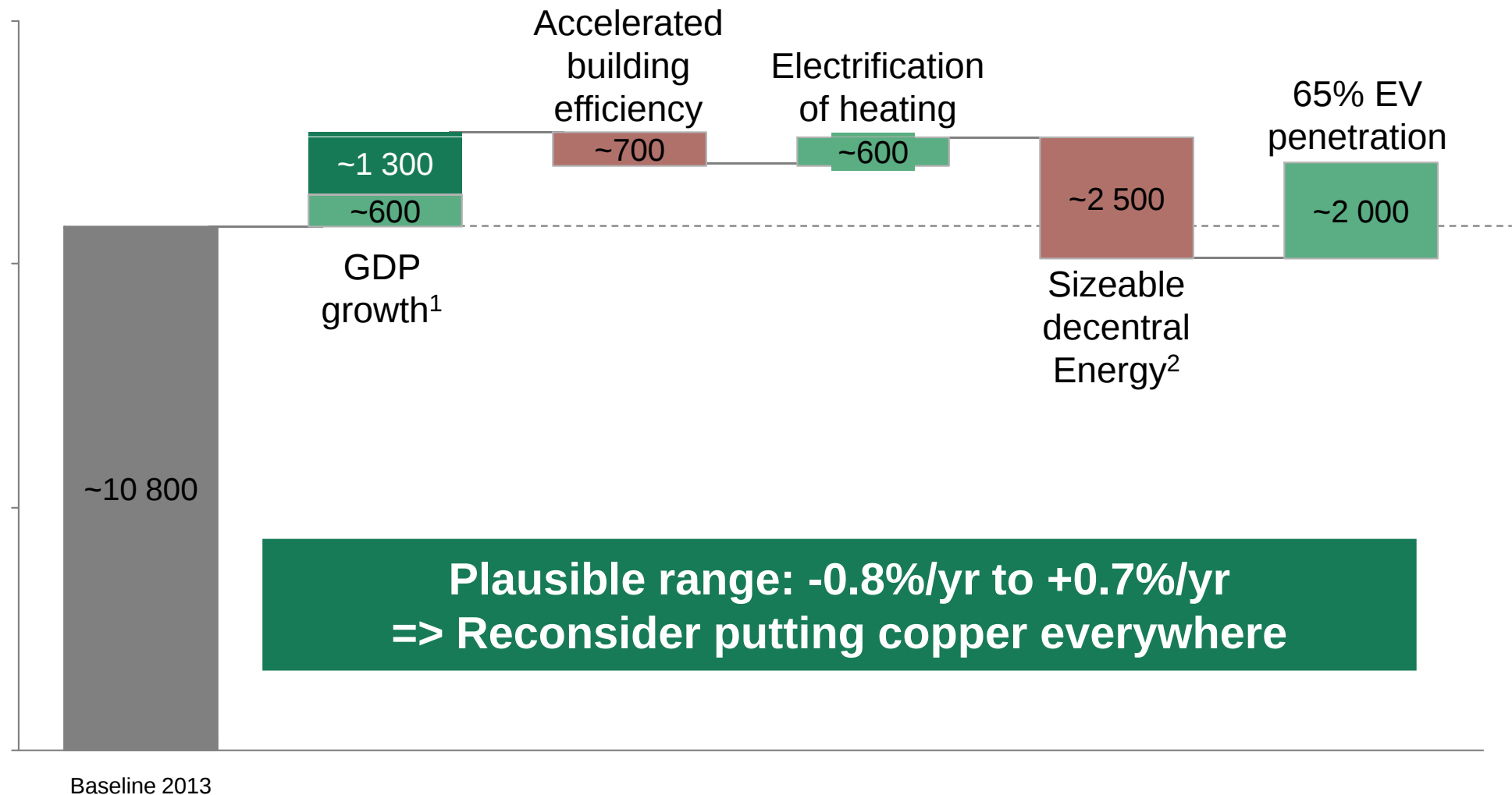
Note: Assumes house consuming 4,500 kWh per year, 2.5kW PV system with 85% performance factor, 40% self-consumption, and 20% excess power sold to the grid.

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- 5 | Sustainable funding for centralized infrastructure (incl. power plants)
- 6 | Sustainable bills for all customers

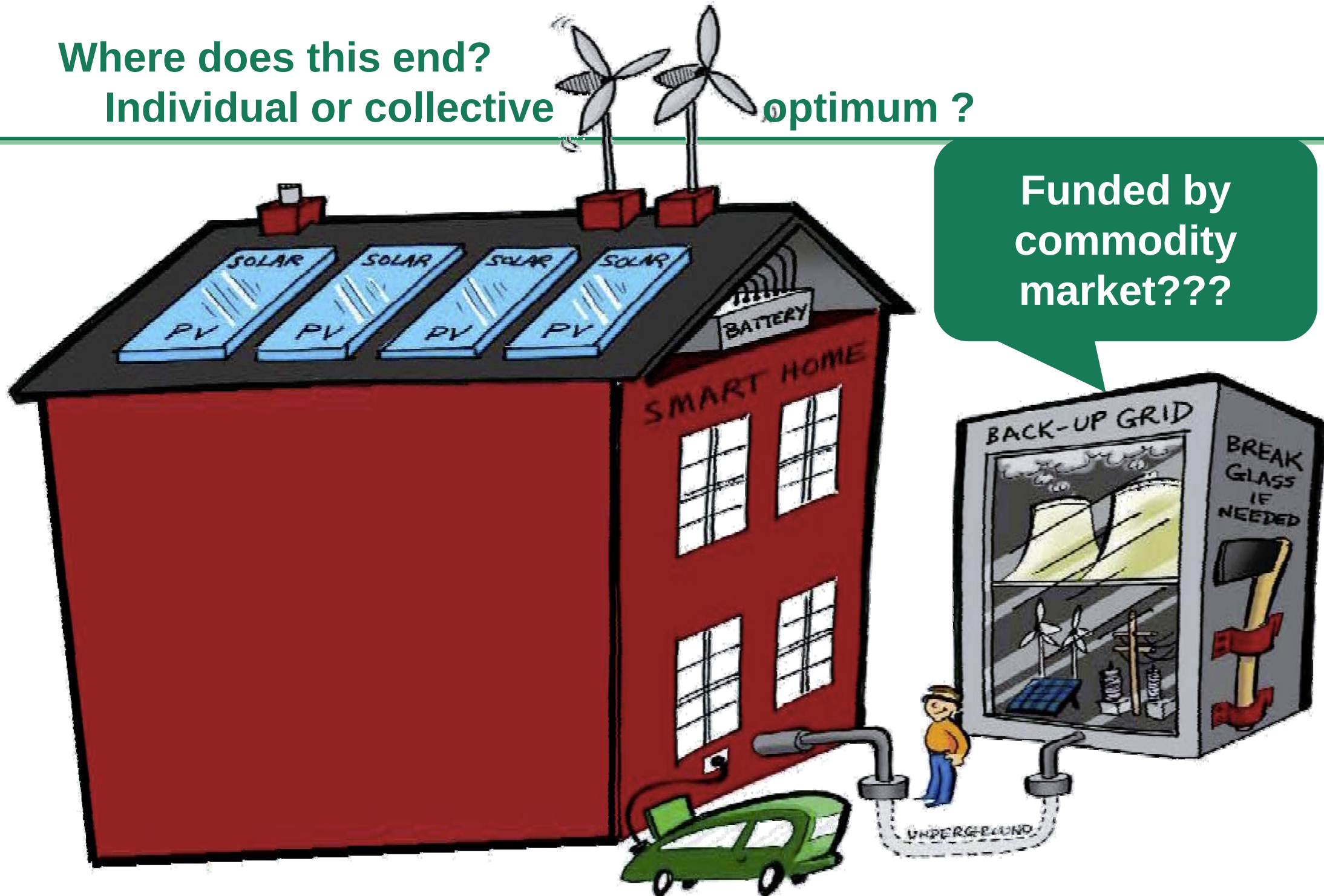
Grid power demand will only grow (a little bit) in case of both robust GDP and large penetration of EVs

OECD centralized power demand - 2040

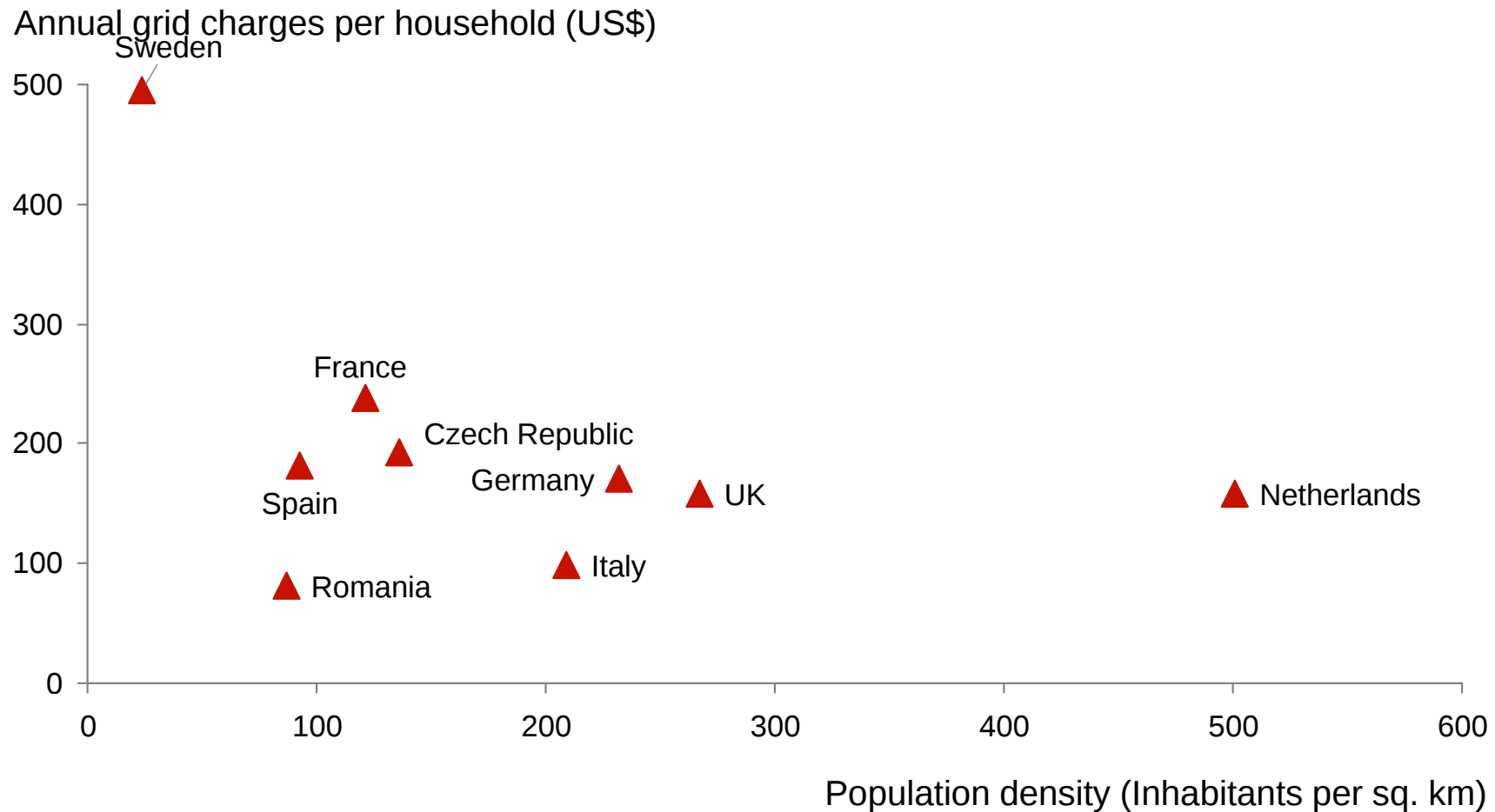


1. moderate, 1.5%/yr to healthy ~2%/yr 2. PV on 30% of buildings, CHP at 15% of industry
Source: BCG analysis (BCG Disruption Model v1); IEA (World Energy Outlook 2015)

Where does this end? Individual or collective optimum ?



Huge possible gains in power distribution charges



Sources: US EIA Residential Energy Consumption Survey; World Energy Council; BCG analysis.

Note: Grid charges are the portion of the electricity bill that goes toward paying for investments in as well as maintaining and operating the grid.

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Thank you

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