



The Role of the Prosumer

The de-centralisation of energy and the opportunities this affords



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Agenda

- The changing environment of the electrical contractor
- What is a prosumer?
- Types of prosumer installations
 - Modes
- Opportunities
- Q&A

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Good news

- After several weeks of living in a strange world, we need some good news
- The following slides offer a glimpse of what the future could hold, including possibly the biggest change to electrical engineering in decades
- Some of this is down the line, some is closer than you think

Regardless of the last few weeks, the world of the electrical contractor is changing

THE CHANGING ENVIRONMENT

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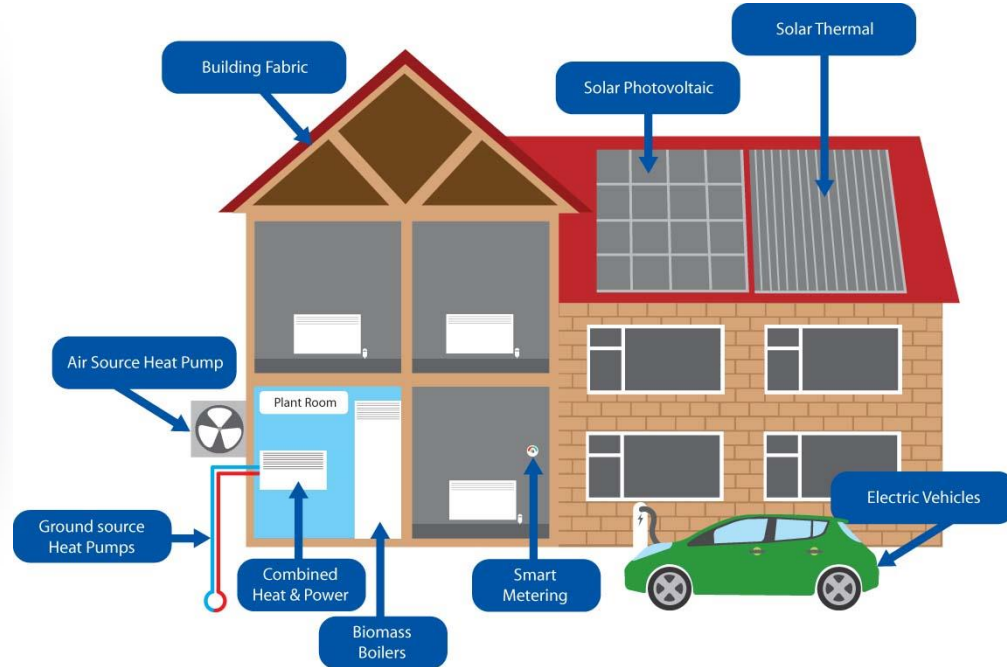
Metropolitan line

Driving change

- Global Climate Change acceptance
- Net carbon zero 2050
- Efficiency legislation
- Energy supply issues
- Rapid advance of technology



The changing world



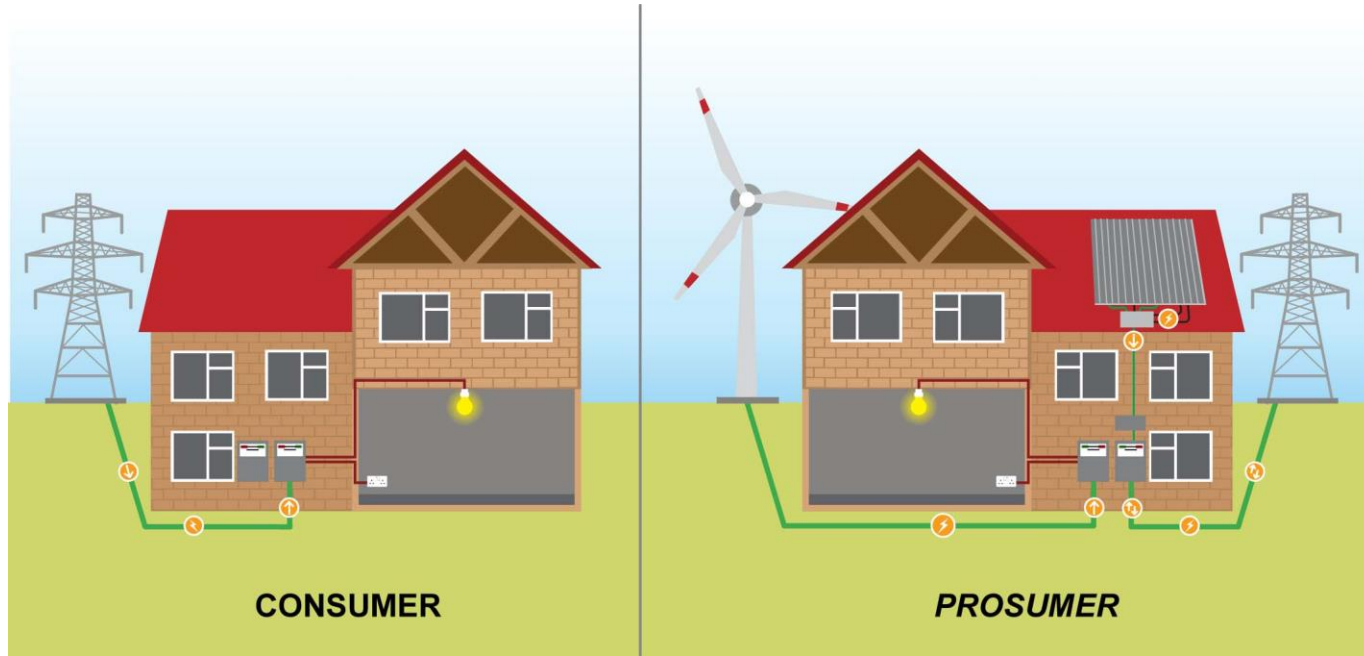
Prosumer – who, what and why?

- October 2018 - new standard was published-IEC 60364-8-2
 - International standard
 - May (may not) be incorporated into future editions of BS: 7671
- Introduced new terminology:
 - Prosumer
 - Prosumer's Electrical Installations (PEI)
- Enhance end user experience
- Push forward decentralisation of energy generation



WHAT IS A PROSUMER?

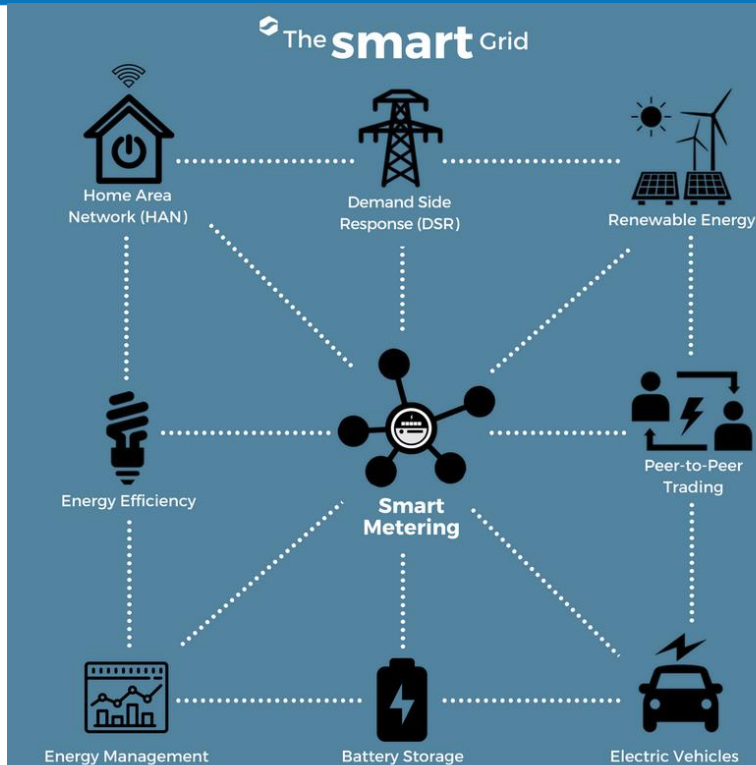
Consumer Vs Prosumer



Smart meters – the start of the smart

- Badly implemented - negative perception
- Huge foresight - essential
- Hinge pin for a safer, smarter and more stable grid
- Facilitate 'load management'
- Robust protocol

Image courtesy of
BEAMA



Smart homes – Model 1: SM-HAN

Smart Meter Home Area Network

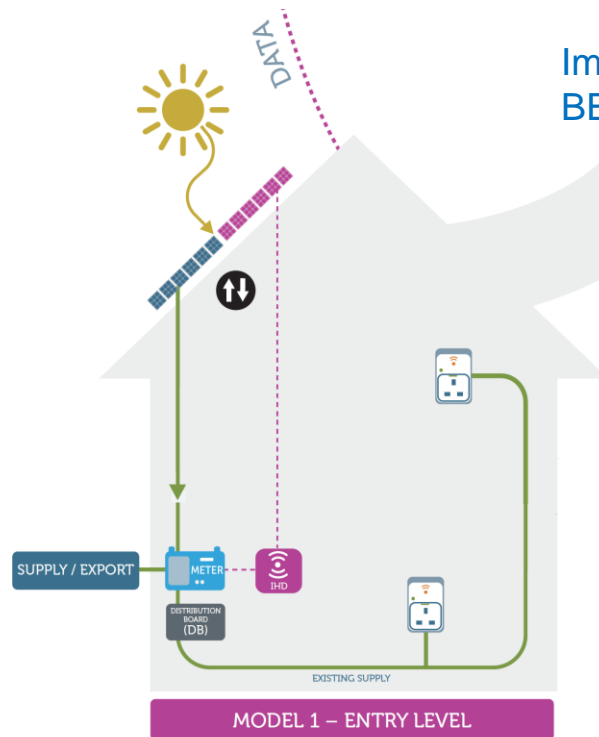
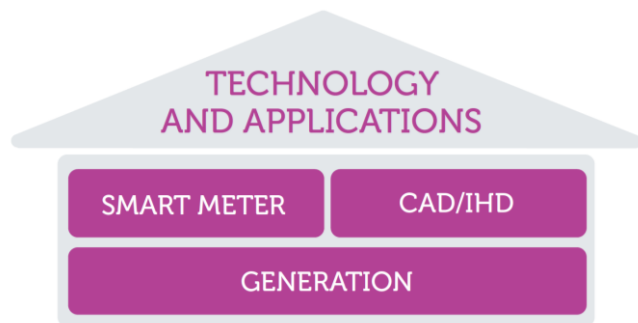
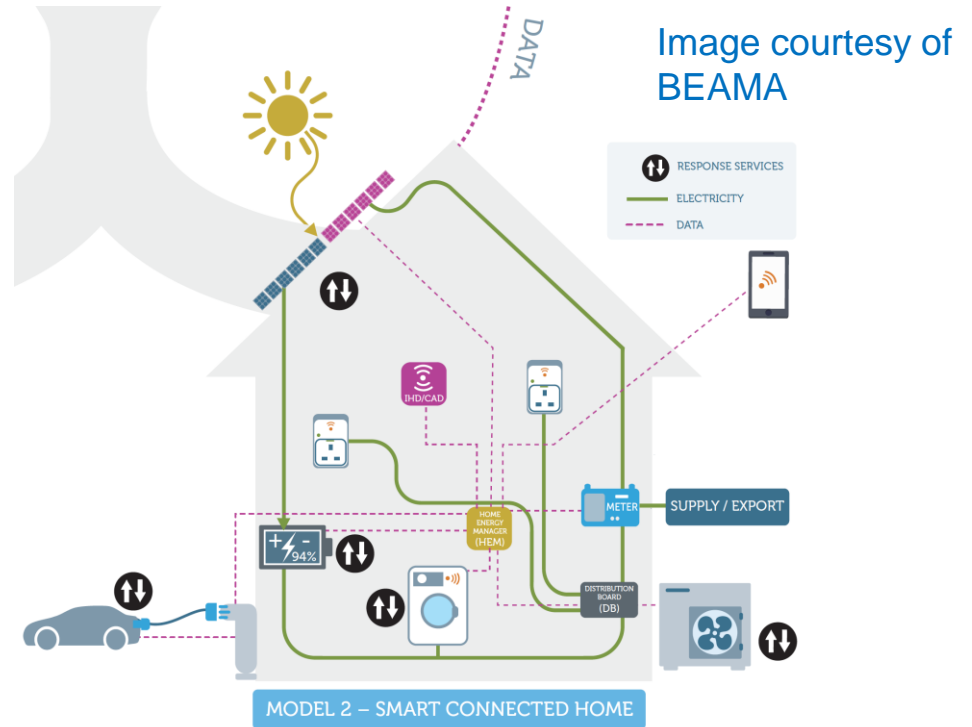
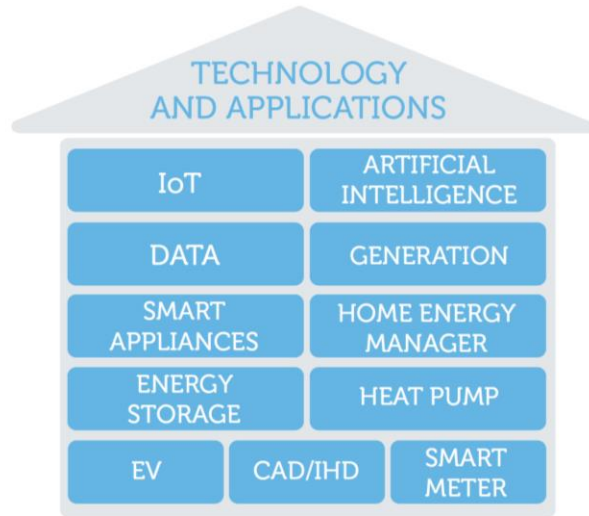


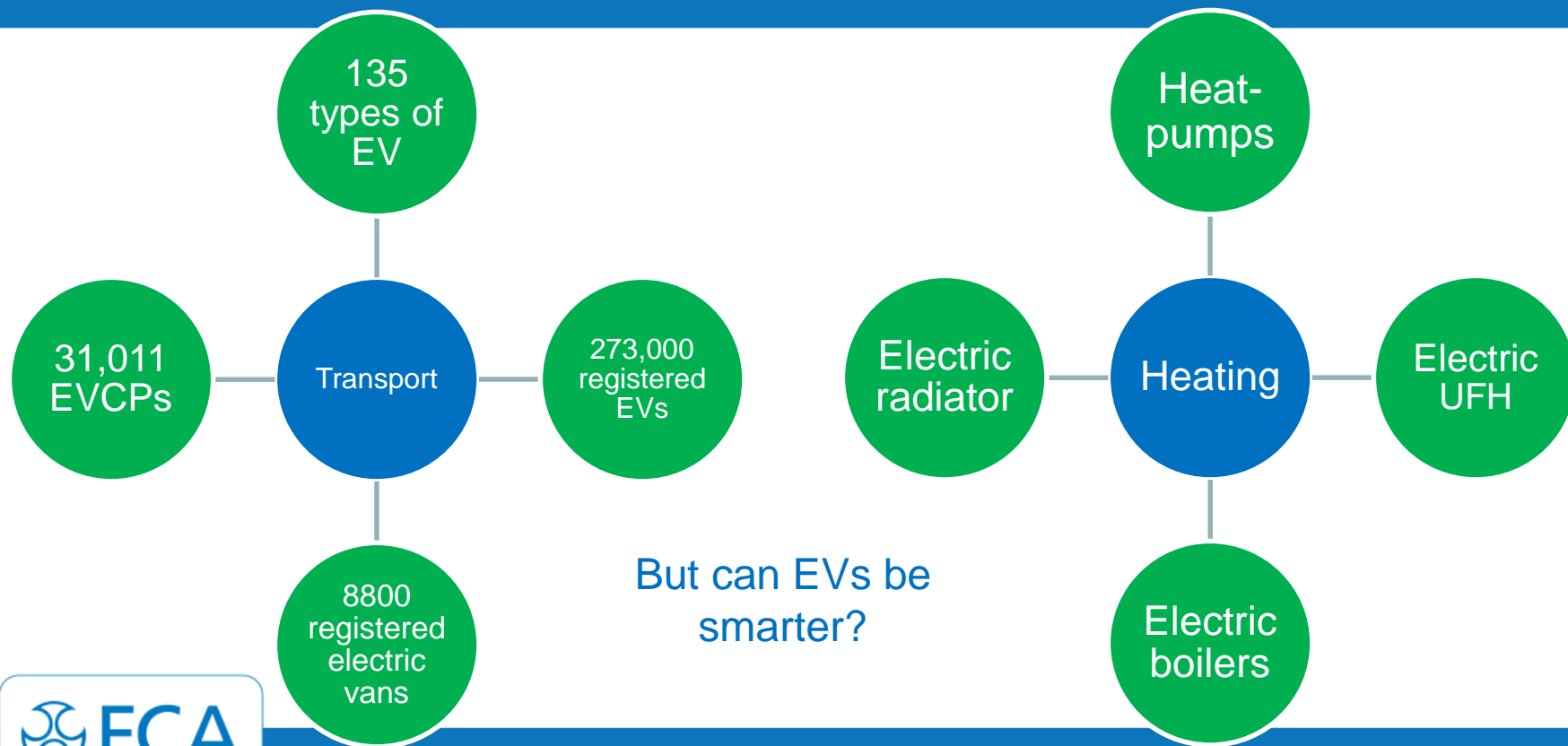
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Smart Homes – Model 2: C-HAN

Consumer Home Area Network



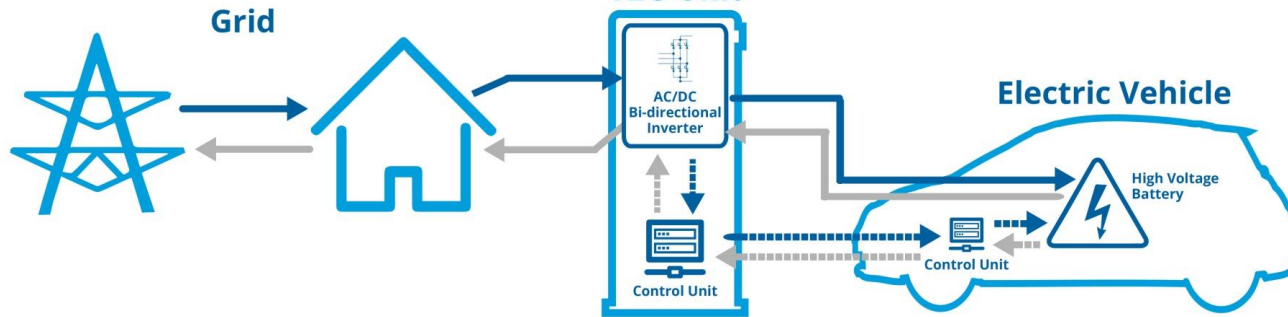
Increased electrification – what we do



Vehicle 2 Grid and energy storage

Vehicle to Grid

Image courtesy of
Cenex



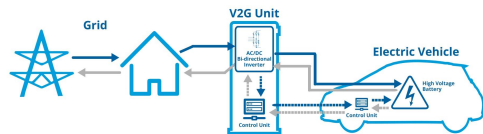
Electrical Energy Storage Systems

Image courtesy of
Tesla



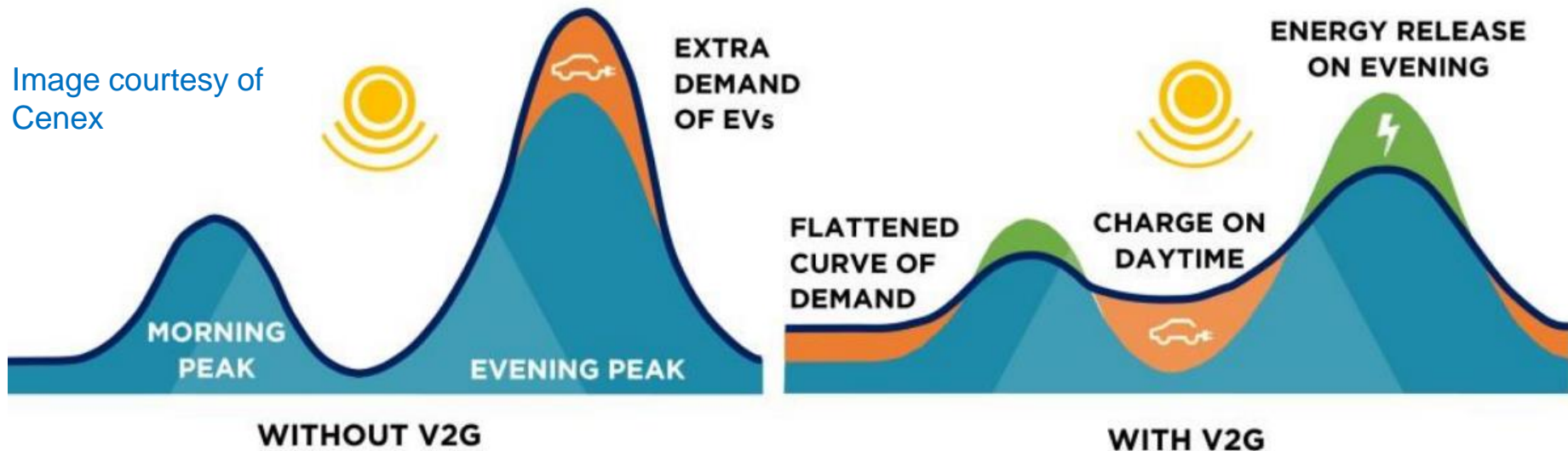
GOLDEN EGG?

Grid balancing with V2G connections

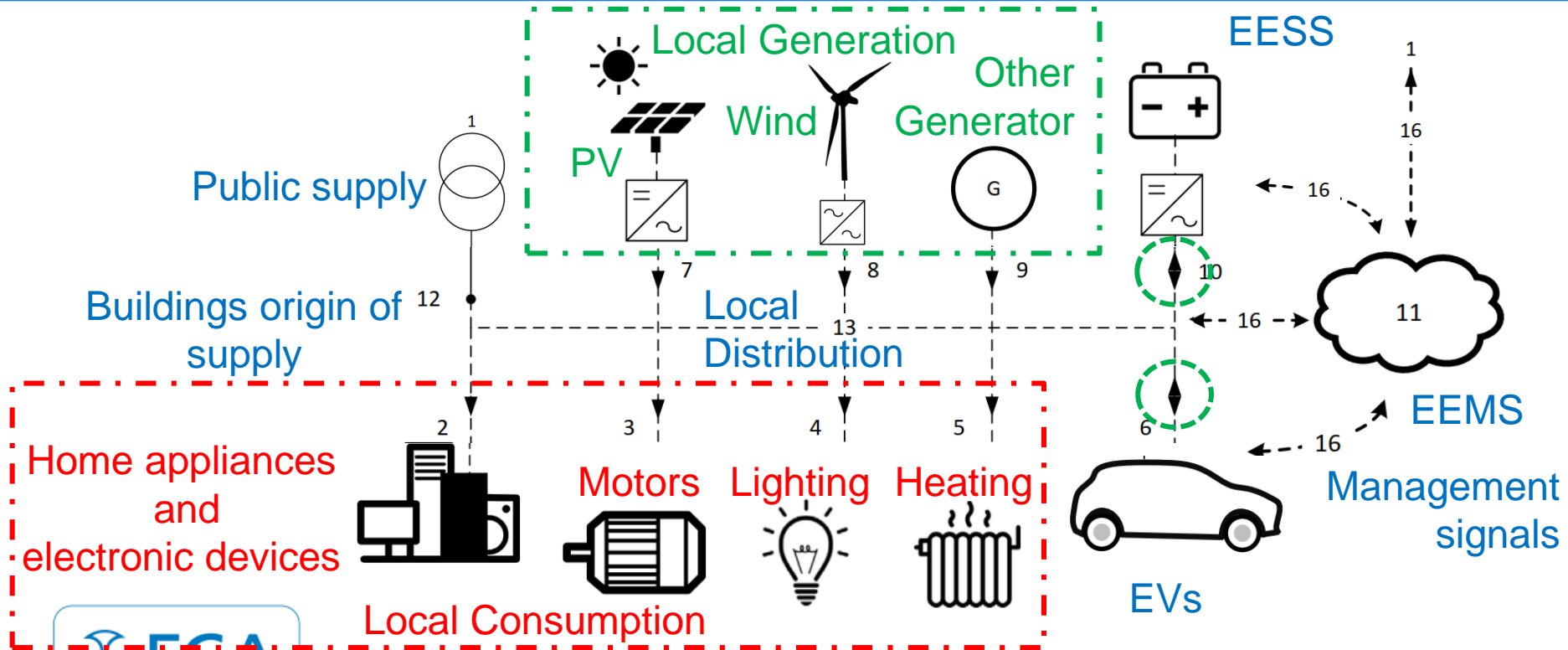


Free Fuel?

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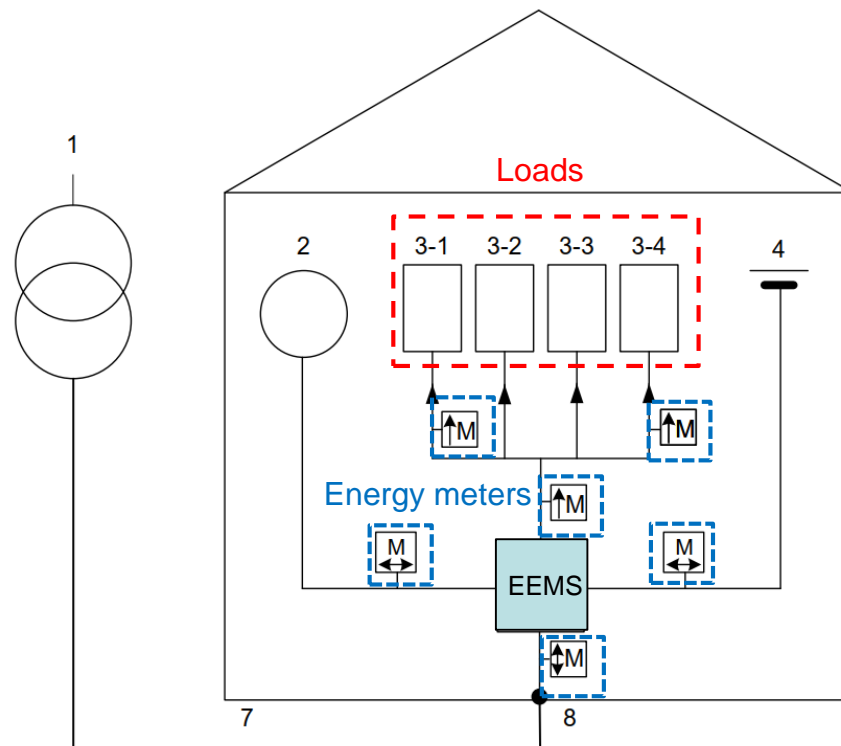
How will this all work?



Example architecture

Key

| | |
|-----|--|
| 1 | Public network |
| 2 | Power supplies |
| 3-1 | Load 1 |
| 3-2 | Load 2 |
| 3-3 | Load 3 |
| 3-4 | Load 4 |
| 4 | Storage units |
| 7 | Prosumer |
| 8 | Origin of installation |
| 10 | Electrical energy management system (EEMS) |
| M | Energy meter/Measuring equipment (M) |
| ↔ | Direction of energy flow |



The following are the recognised types of prosumer installations

TYPES OF PROSUMER INSTALLATIONS

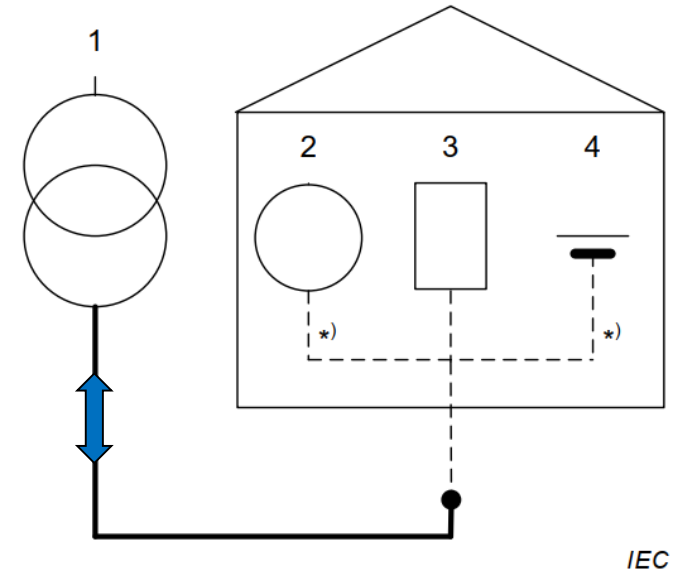
Types of PEI - individual

- Individual

- This is the type of installation seen in the previous example and is characterised by ONE installation having the possibility to both consume and produce electrical energy, with a management system for its operation

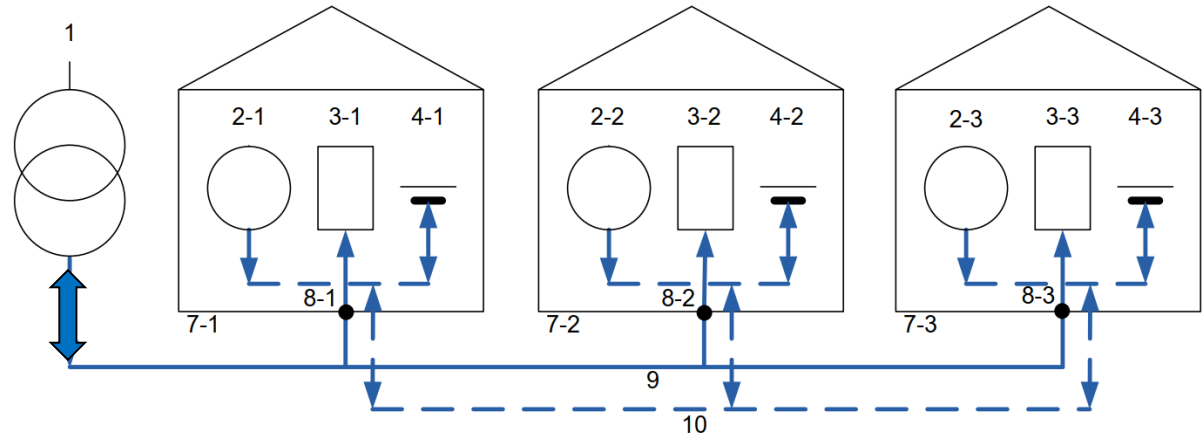
Key

- | | |
|----|---|
| 1 | Public network |
| 2 | Power supplies |
| 3 | Loads |
| 4 | Storage units |
| *) | Optional (at least, one of them shall be present) |



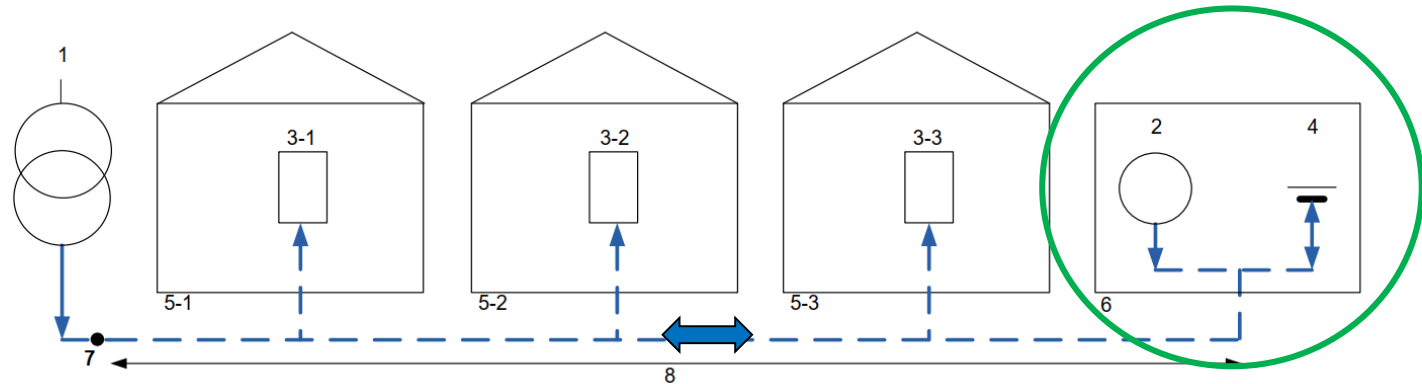
Types of PEI - collective with individual gen and storage

- Group of prosumers (private houses/flats/shops) who co-operate and coordinate resources to erect common electrical power supplies
- With a collective PEI, different power supplies may supply all prosumers through either the PEI distribution system or through the distribution network
- **Individual generation and storage**



Types of PEI – collective gen and storage

- This could also include having a set of generation and storage devices, detached from the individual properties, *but* commonly supplying them all
- Then we have the different **modes**

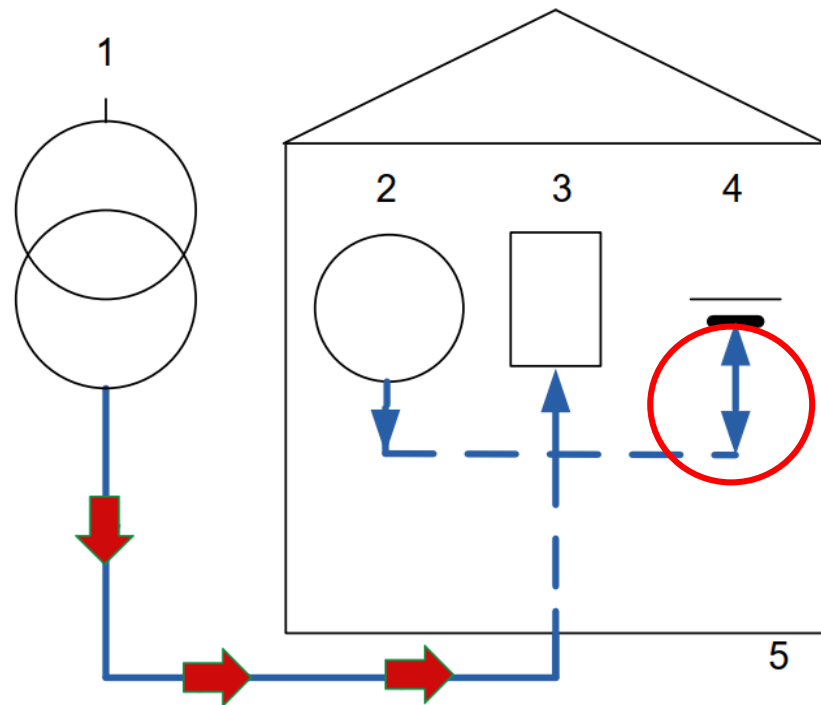


Direct feeding mode

- The PEI is supplied from the grid
- Local EESS could supply power to buildings loads or be charged by the grid / local energy generation

Key

| | |
|---|----------------|
| 1 | Public network |
| 2 | Power supplies |
| 3 | Loads |
| 4 | Storage units |
| 5 | Consumer |

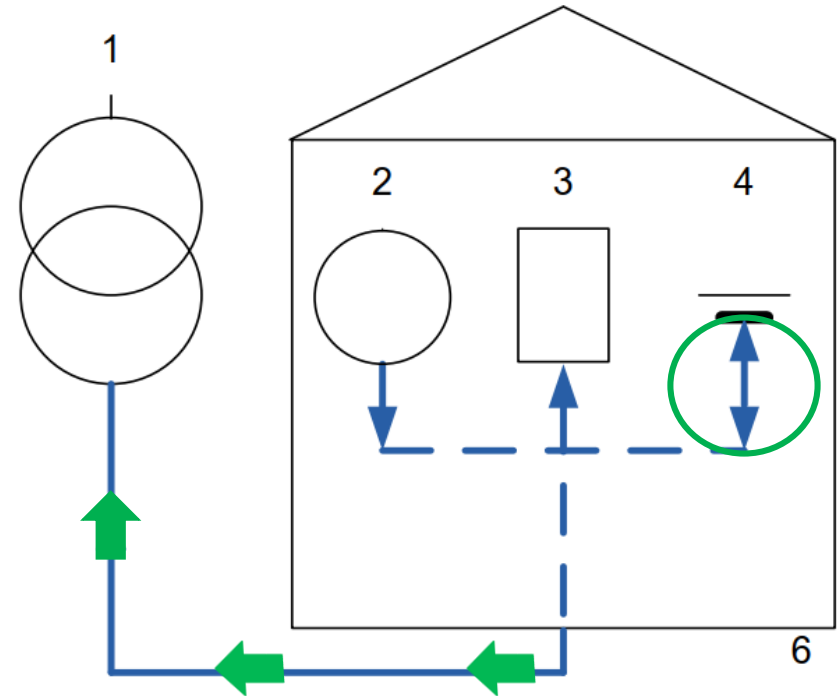


Reverse feeding mode

- The grid is supplied by the PEI
- Local EESS could supply power to buildings loads or be charged by the grid / local energy generation

Key

| | |
|---|----------------|
| 1 | Public network |
| 2 | Power supplies |
| 3 | Loads |
| 4 | Storage units |
| 6 | Producer |

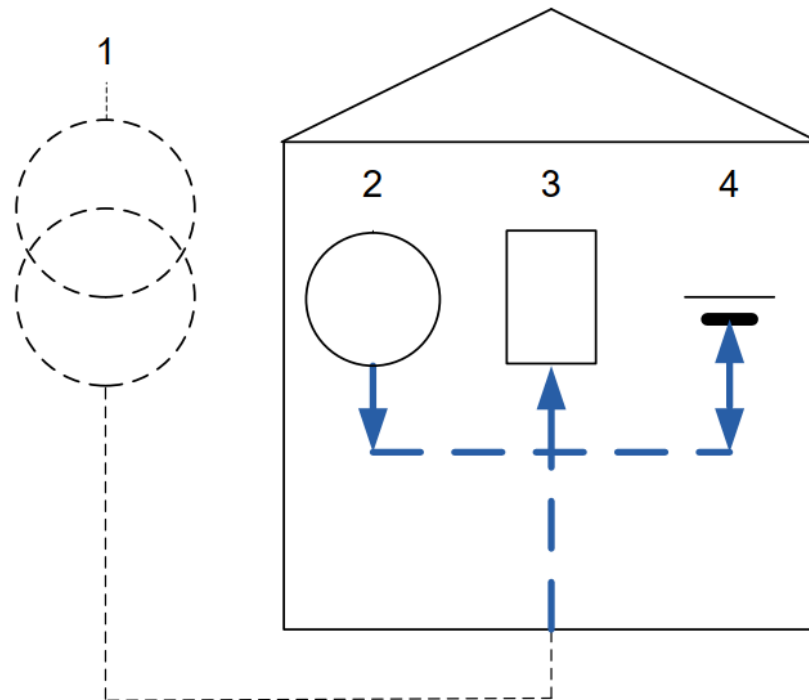


Island mode

- Where the PEI is **disconnected** from the grid and supplied solely from their own generator and storage device
- This could be the triggered **automatically** or through **deliberate action**

Key

| | |
|---|----------------|
| 1 | Public network |
| 2 | Power supplies |
| 3 | Loads |
| 4 | Storage units |



This is our industry, this is our work, we should ensure it comes to us

OPPORTUNITIES

Opportunities – this is OUR work

- Apprenticeship
- Apprenticeship
- Any business looking for a prosumer installer
- And if you think



consider

Prosumer – key points

- **Address user requirements**
 - Reduce energy costs
 - Play an active part in generation and usage of their energy
- **Move forward the de-centralisation of energy generation**
 - Reducing users and the UK carbon footprint and environmental impact
- **Create support and stability for the smart grid going forward**
 - Including a robust infrastructure for exponential EV adoption

Wealth of opportunities ahead

Now is the time

- These are all opportunities for ECA Members



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But remember, keep safe

- When going back to work, please ensure you adhere to all social distancing measures, such as keeping 1 m apart

In all directions



Questions?

