

Delta Energy & Environment Ltd
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Where is Demand-Side Flexibility in Europe today?

SEDC Symposium 2016: Empowering Residential and SME consumers

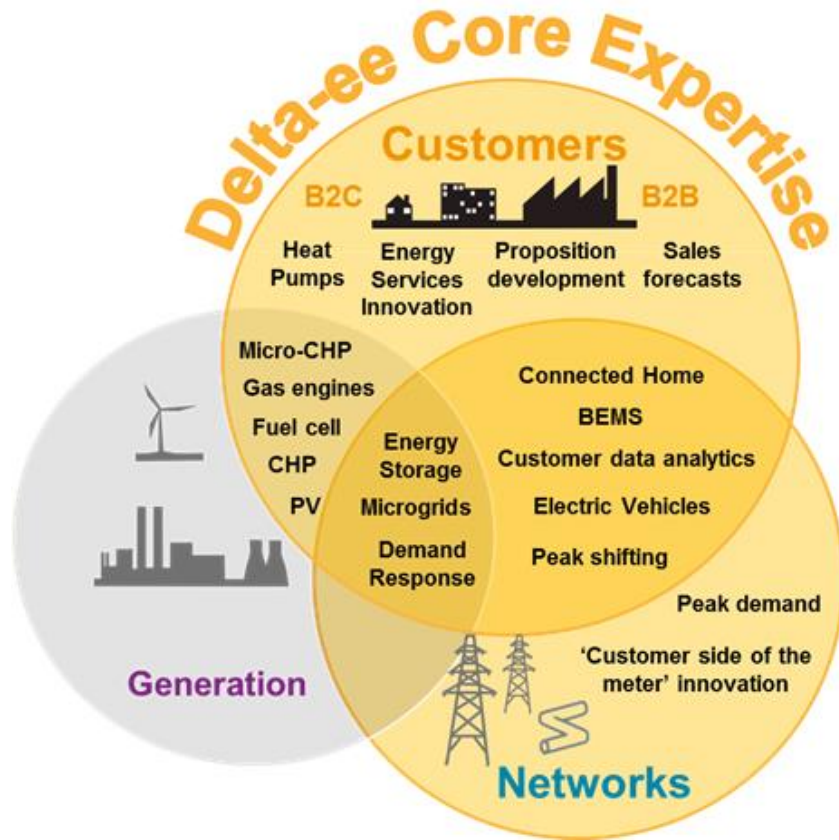
20th October 2016

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- ▶ Demand side response trend overview
- ▶ Residential & SME loads and enablers
- ▶ Examples of residential demand side response today
 - ▶ Explicit
 - ▶ Implicit
 - ▶ Local optimisation
- ▶ Industry view of residential & SME demand side response

Delta-ee helps companies navigate the transformation to a more distributed, customer centric, service-orientated energy future.



Heat | Digital | Flexibility

Delta-ee brings:

- ▶ Customer insight
- ▶ Technology expertise on the customer side of the meter
- ▶ Policy & regulation
- ▶ Detailed market insight
- ▶ Business model innovation

Delivering:






- ▶ Market analysis & scenarios
- ▶ Demand forecasts & profiles
- ▶ Technology assessment
- ▶ Strategy development & business model analysis
- ▶ Customer propositions

Selected clients:



Demand Side Response Trends

Opportunities 

			
 <ul style="list-style-type: none"> ▶ Diesel generators ▶ Industrial loads ▶ CHP <p>Flexibility today</p>	<ul style="list-style-type: none"> ▶ Availability and low cost ▶ Scale 	<ul style="list-style-type: none"> ▶ Environmental aspect of diesels ▶ Interrupting processes ▶ Limited availability 	<ul style="list-style-type: none"> ▶ Further growth possible
 <ul style="list-style-type: none"> ▶ Storage ▶ Large building loads <p>Emerging flexibility</p>	<ul style="list-style-type: none"> ▶ Wide range of flexibility ▶ Clean resource 	<ul style="list-style-type: none"> ▶ Expensive ▶ Limited availability 	<ul style="list-style-type: none"> ▶ Largely untapped
 <ul style="list-style-type: none"> ▶ Distributed loads within buildings ▶ Residential flexibility <p>Future flexibility</p>	<ul style="list-style-type: none"> ▶ Wide range of loads ▶ Clean resource 	<ul style="list-style-type: none"> ▶ Cost of connecting loads ▶ Cost of acquiring customers 	<ul style="list-style-type: none"> ▶ Very large untapped market



Lights



Electrical
appliances



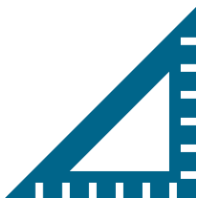
HVAC



Electric
vehicles



Storage

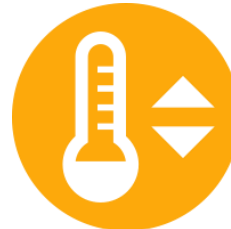




Lights



Electrical appliances



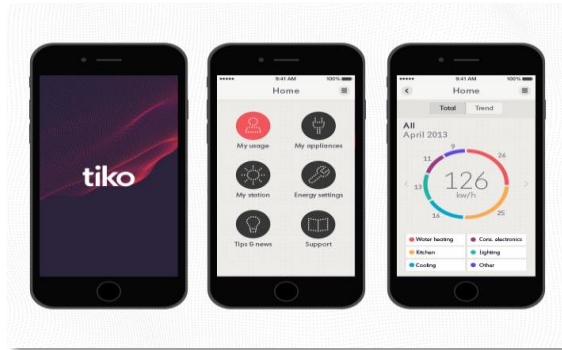
HVAC



Electric vehicles



Storage



Flexibility from electric heating for the balancing market while offering the customers a great heating controller

- ▶ Low cost retrofit of controls to electric heating (e.g. heat pumps)
- ▶ Algorithms to determine how much they can interrupt each heat pump without affecting comfort
- ▶ Customers get (pay for) a sophisticated heating control app – comfort, control, energy saving – and ‘supporting a better world’

How does it extract value?

System operator balancing services

Energy supplier / time of use tariffs

Self-consumption

Network charges (peak demand & use)

Capacity markets

Reference: Delta-ee Flexibility Research

Implicit Demand Side Response



Lights

Electrical appliances



HVAC

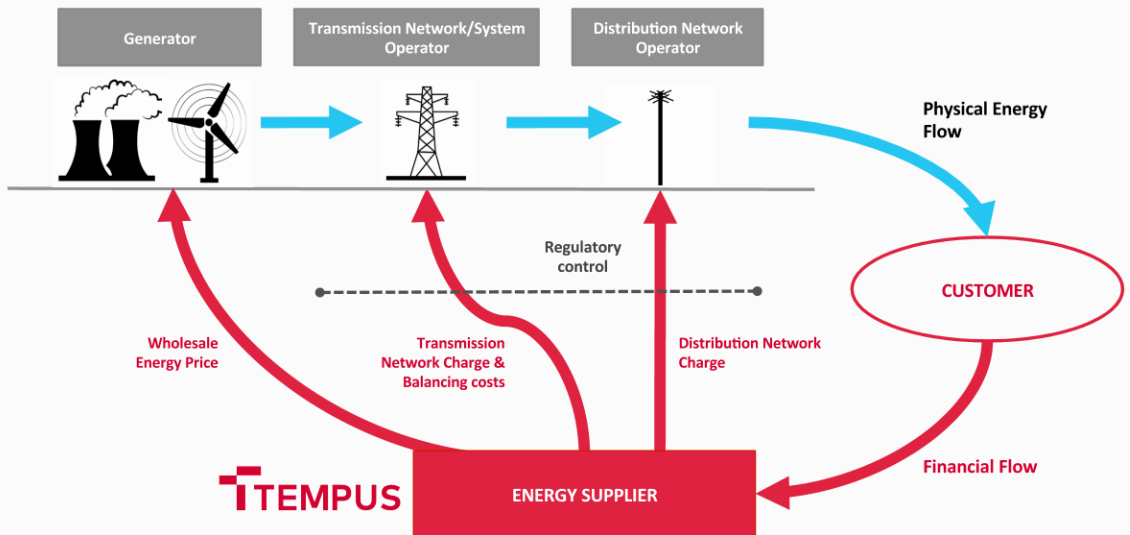


Electric vehicles



Storage

What is it?



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Reference: Tempus Energy



Lights



Electrical appliances



HVAC

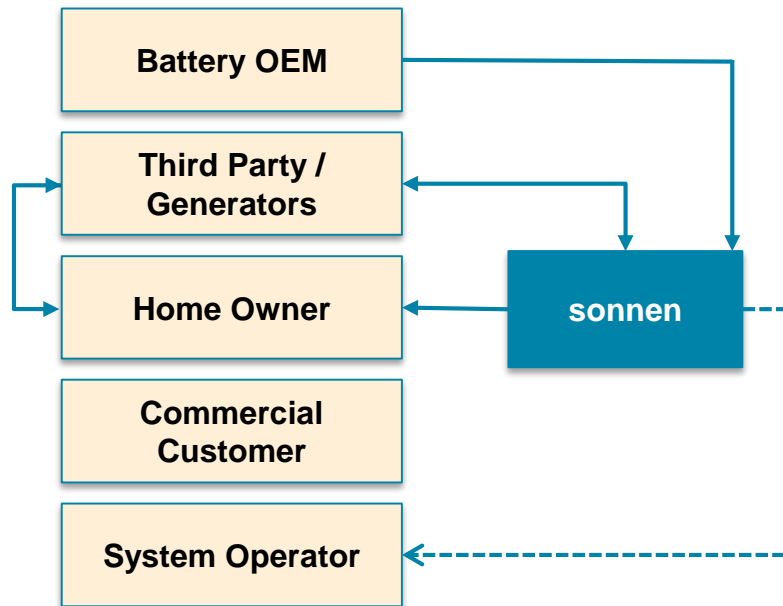


Electric vehicles

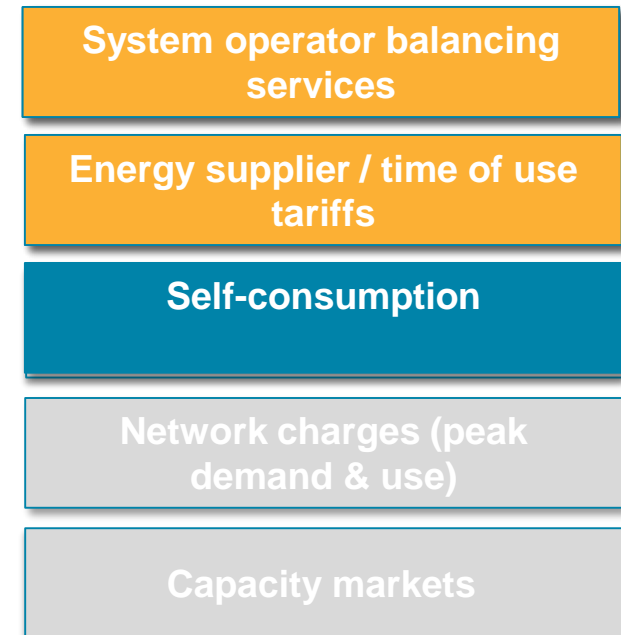


Storage

What is it?



How does it extract value?



Reference: Delta-ee Energy Storage Research Service

Exploiting flexibility today



Lights



Electrical appliances



HVAC



Electric vehicles

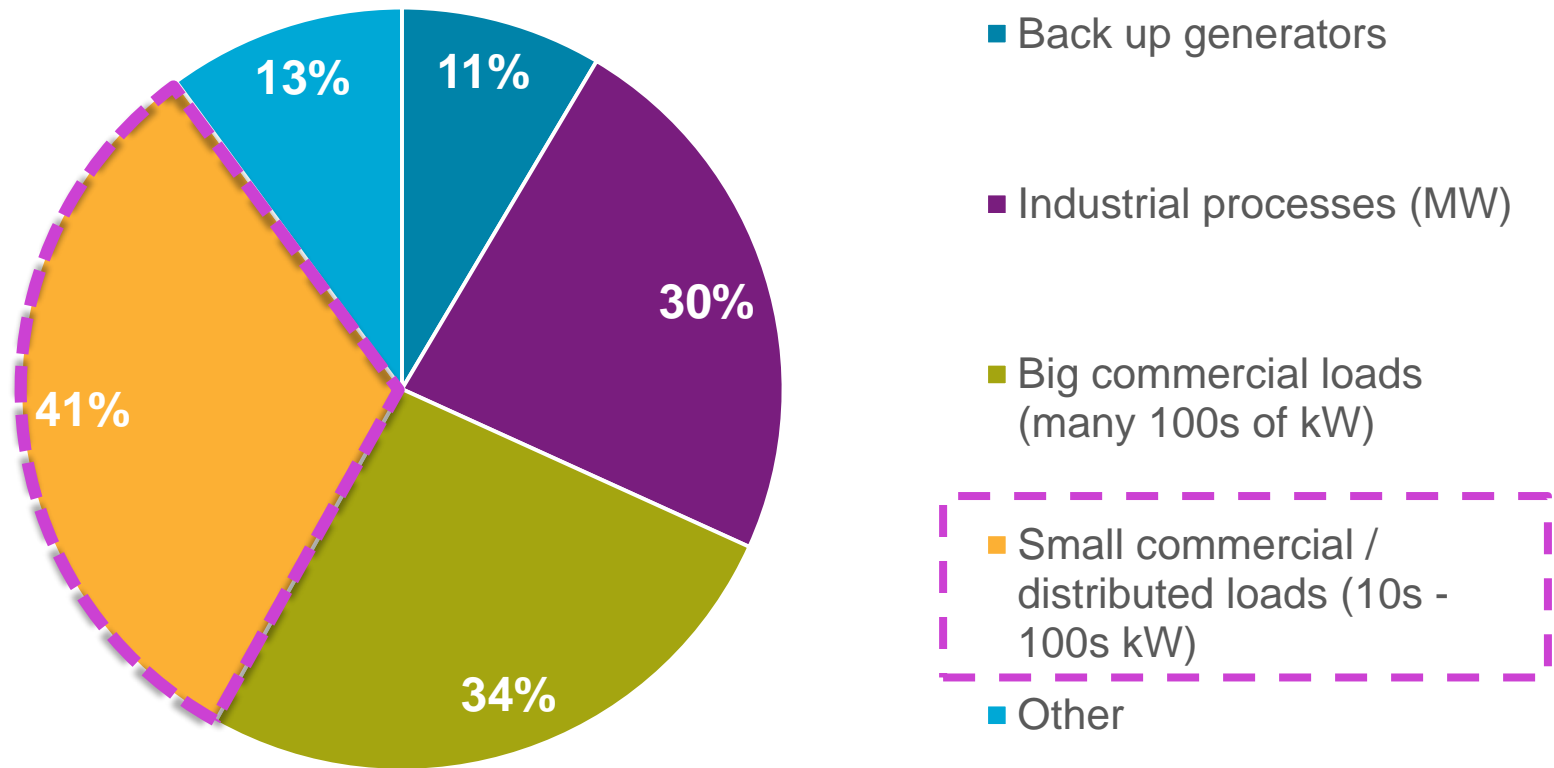


Storage



Reference: Delta-ee Energy Services Innovation Research

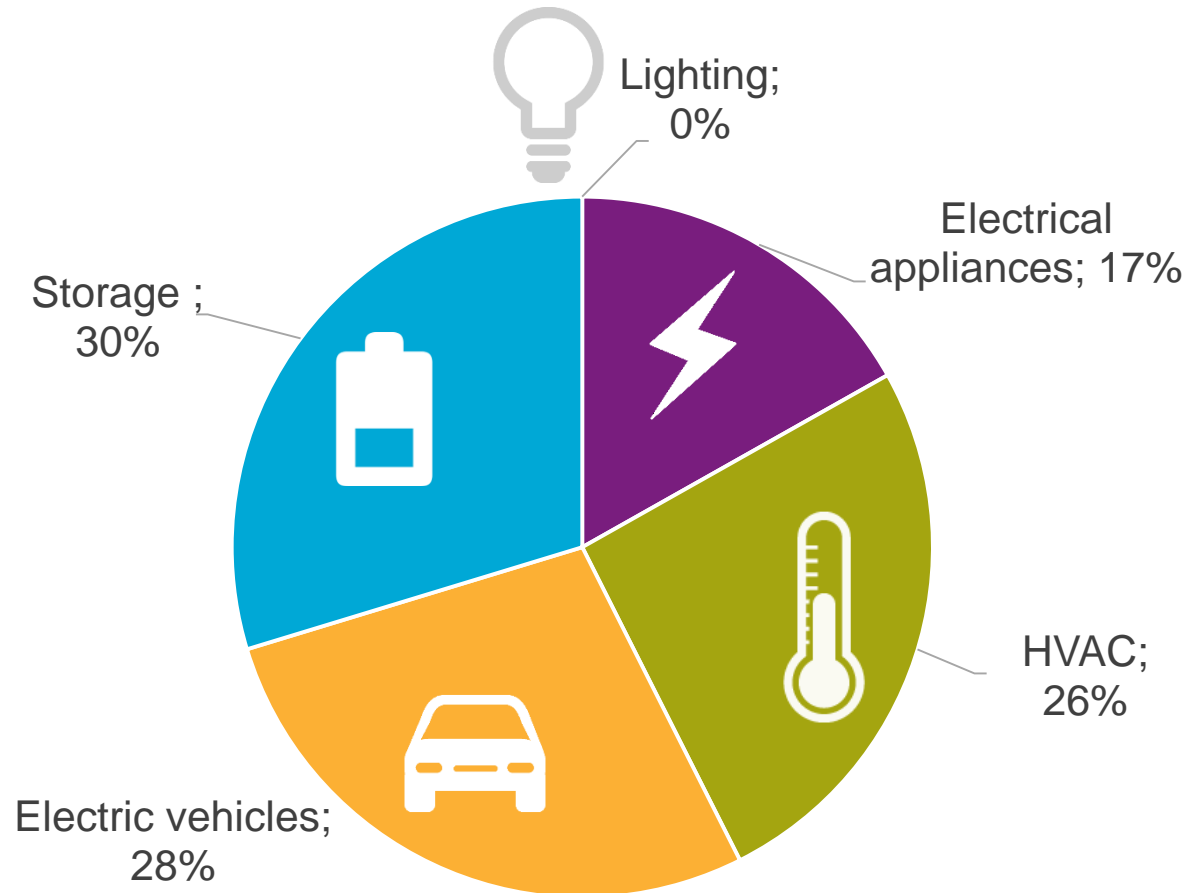
In 5 years time what do you think will be the largest source of demand side response?



Reference: Industry audience response from Delta-ee's webinar: 'Battleground for Flexibility: Residential Demand Side Response'.

Diversity in residential loads offering flexibility hoped for

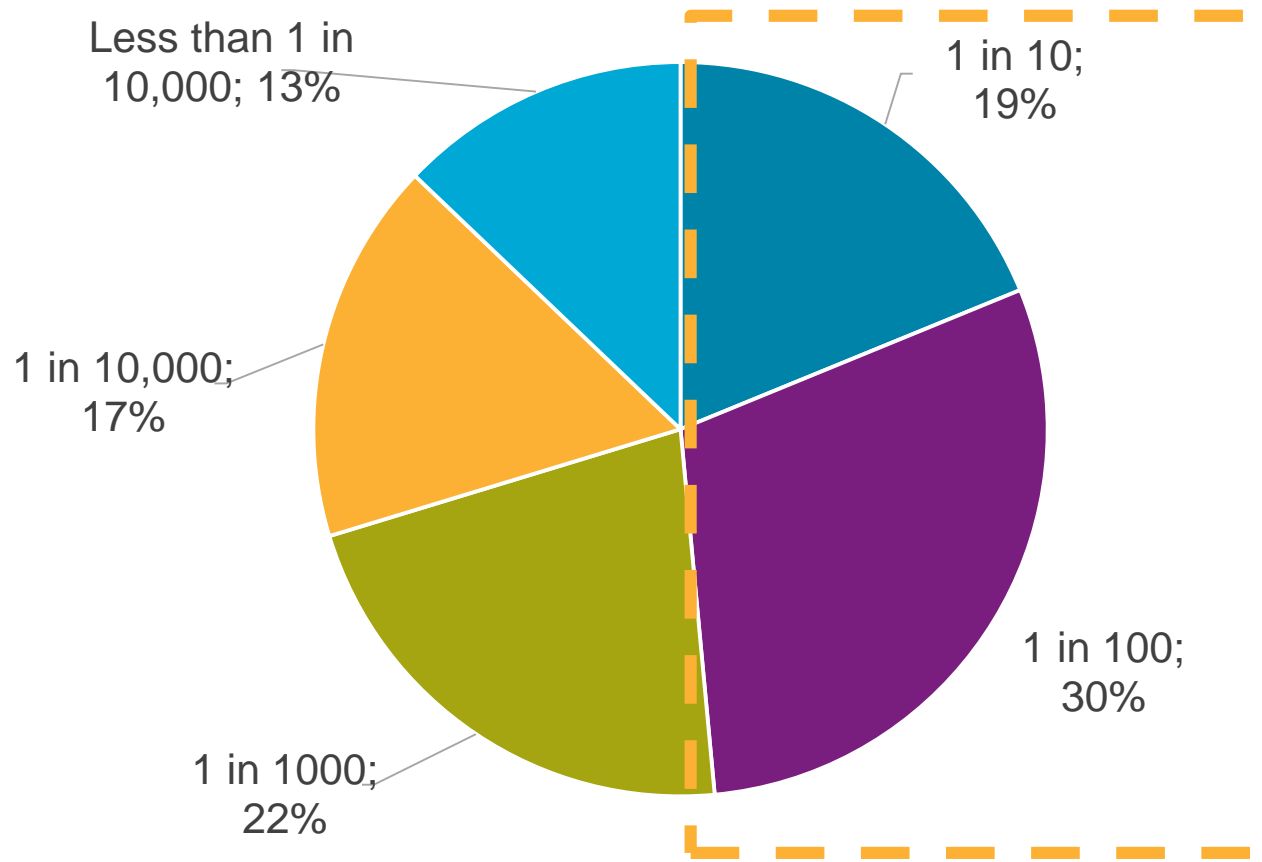
In 2020 which loads will be providing the most MW/MWh of flexibility?



Reference: Industry audience response from Delta-ee's webinar: 'Battleground for Flexibility: Residential Demand Side Response'.

Residential flexibility viewed as big potential opportunity

In 2020 what proportion of homes in Europe will be providing residential flexibility?



Reference: Industry audience response from Delta-ee's webinar: 'Battleground for Flexibility: Residential Demand Side Response'.

Contact us for more information about Delta-ee's:

- ▶ Flexibility Multi-Client Study and Bespoke Research
 - ▶ Energy Storage Research Service
 - ▶ Energy Services Innovation Research
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- ▶ **E-mail us for a copy of the presentation.**
 - ▶ **We'd be delighted to talk with you** by phone or in person – at our Edinburgh, Netherlands, or Denmark offices, or at your offices.
 - ▶ For more information visit:
www.delta-ee.com

Our new multi-client study into demand side response will analyse:

- ▶ Market insight
- ▶ Competitor landscape
- ▶ Business models
- ▶ Technical innovations
- ▶ Customer insight

Thank you for your attention

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