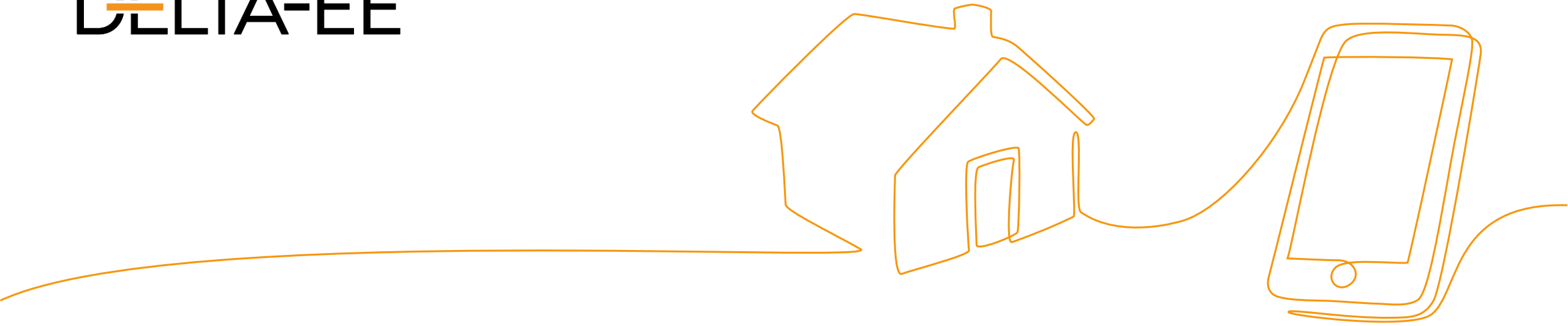


**DELTA-EE**



# **10 USE CASES OF REAL-TIME ENERGY DATA**

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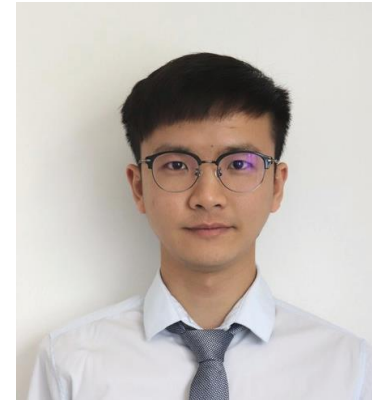
# On the webinar today

**David Trevithick**  
Energy Insights + principal  
analyst



[david.trevithick@delta-ee.com](mailto:david.trevithick@delta-ee.com)

**Zuoxiang Zhang**  
Energy Insights + analyst



[zuoxiang.zhang@delta-ee.com](mailto:zuoxiang.zhang@delta-ee.com)

# Housekeeping



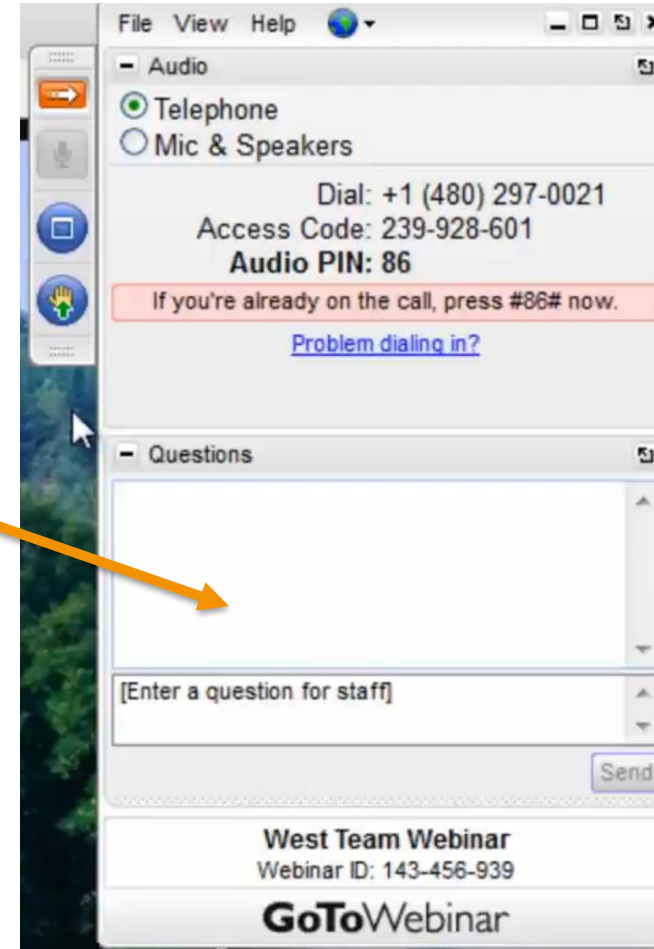
~45 minutes including Q&A



You can write down a question which we will come to at the end of the webinar



*Webinar is being recorded & slides will be sent out afterwards!*



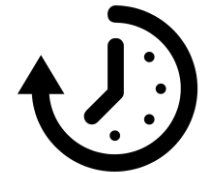
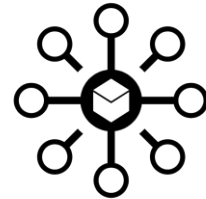
# Agenda

- **How developed is the consumer-facing real-time energy data market in Europe?**
- **What are the 10 leading use cases of real-time energy data?**

# **How developed is the consumer-facing real-time energy data market in Europe?**

# Today's energy insights market is still dominated by SaaS solutions

- Energy insights are becoming a central component of more and more energy retailers' customer engagement and digital transformation strategies.
- Today, most residential consumers receive energy insights from a software platform based on standard smart meter data and AMR / AMI solutions.
- Only a few energy retailers also provide a (near) real-time services which send consumption data immediately after consumer's energy behaviours.

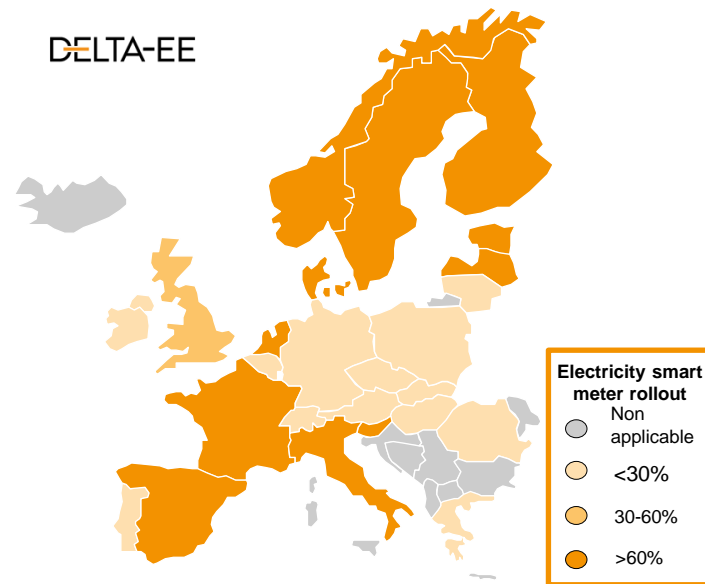


# Challenges faced by standard smart meter data

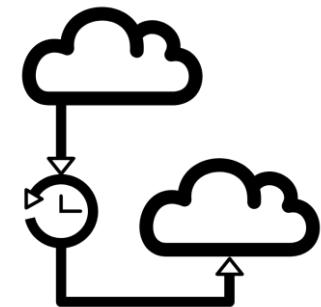
- Data access is not yet available in every European country.

- Data granularity from the national datahub / DSOs is not high enough.

- Data latency in some countries may last for several days.



Granularity	Country
15 mins	
30 mins	
1 h	
>1 h	



*In practice, the data transmission process can take several days in some countries.*

# Real-time energy data range

**Truly real-time** energy data refers to sending energy data and analysis to the user interface within 1 second after consumers' energy behaviour.

< 1s

The data is **near real-time** if it is sent within 10 seconds.

1~10s

The data is **enhanced** if it is available within several minutes or even hours.

10s~hours

**Real-time experiences** are created via timely alerts using non-real-time data (e.g. demand response alert at peak times.)

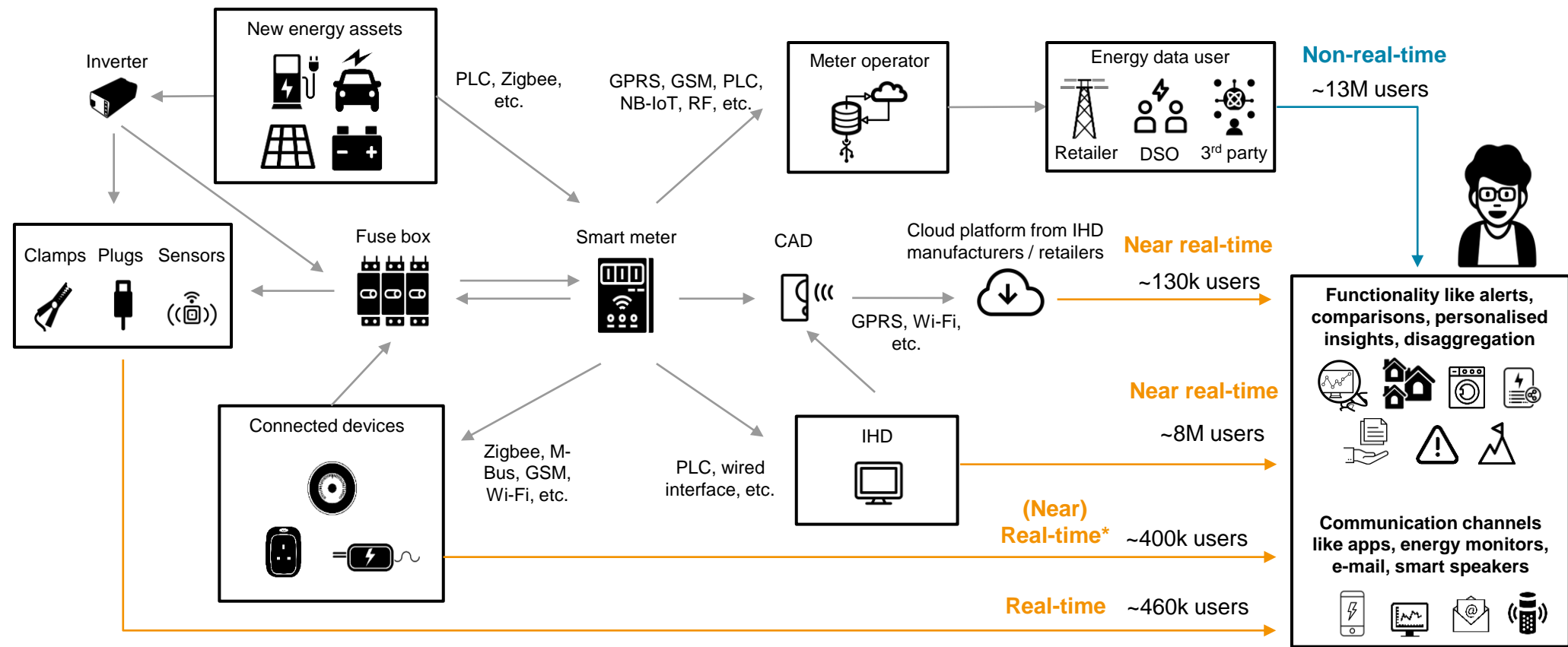
>1d

Data latency



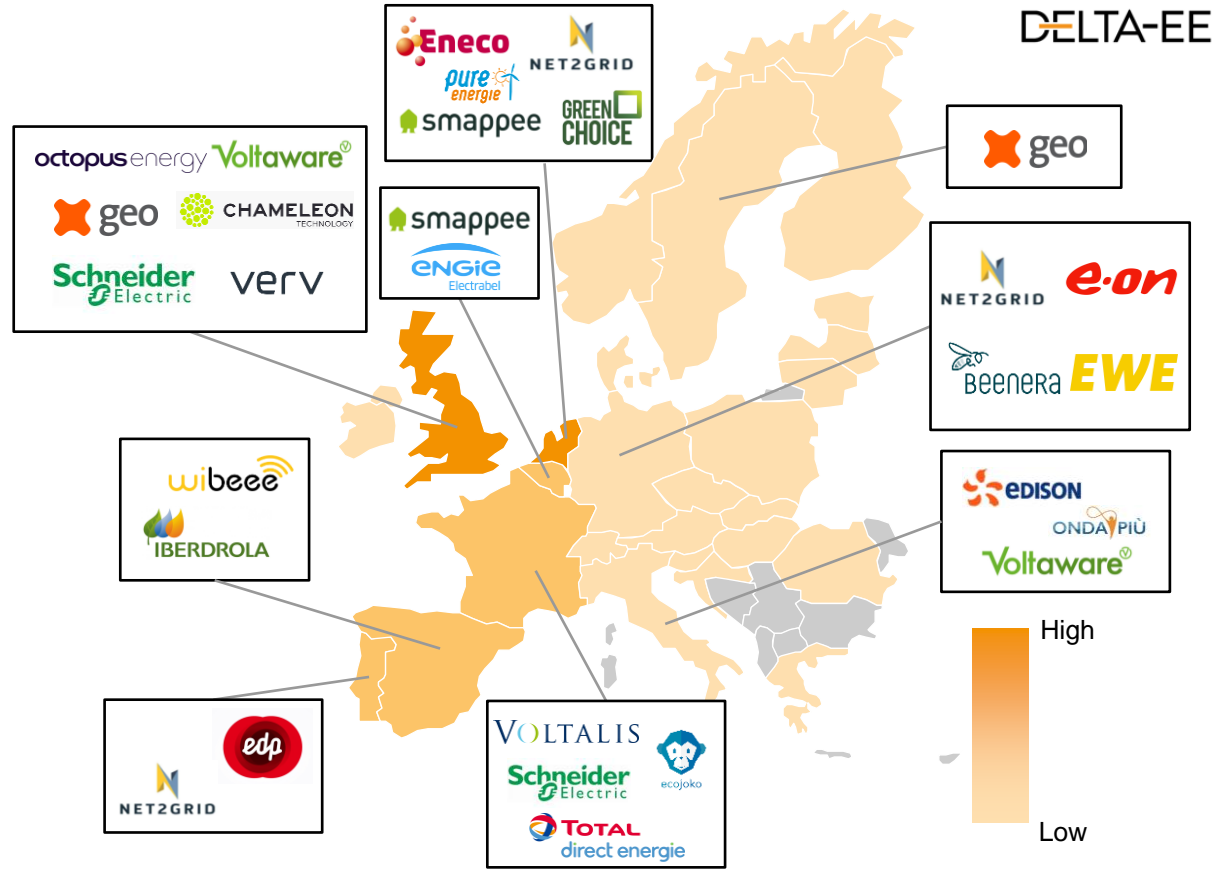


# How to obtain real-time energy data in households?



# Real-time energy data markets today

Real-time energy data user base and market players by 2021\*



\*Non-exhaustive list, does not include trials, pilot projects, etc.


# Poll 1


**What is the biggest barrier to higher adoption of customer services using real-time data?**


- a) Customer demand**
- b) Supply side**
- c) Regulation / infrastructure**
- d) Don't know**


# **What are the 10 leading use cases of real-time energy data?**


# Leading real-time energy data use cases


- 1



**Home awareness and monitoring**
- 2



**Reduction of energy bills and carbon footprint**
- 3


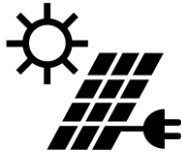
**Higher quality of energy insights**
- 4


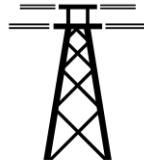
**Fault detection and prevention**
- 5


**Connected devices for home energy management**
- 6


**Empowers pre-pay customers**
- 7


**Improves home protection and vulnerable people care**
- 8


**EV smart charging optimisation**
- 9


**Solar PV optimisation**
- 10


**Automated and behavioural demand response**

# Increased home energy awareness and monitoring



- Experiencing the impact of energy actions in real-time quickens and deepens people’s home energy awareness.
- The immediacy of the link between the data and real-life can also build customer trust.
- Real-time energy data customers feel they have a better idea of what they’re spending on energy, and are more conscious of, and more in control of their energy use.

Device	Room	Home
Understand relative energy cost by device	Educate children about their energy use in their room	Monitor energy flows such as solar PV, grid export
Identify energy waste such as devices left on stand-by	Understand energy cost of home office space for tax purposes	Identify energy (in)activity at home such as cleaner at work, or children back from school
Check remotely that nothing has been left on when away from home	Split home energy bill amongst tenant sharers fairly	Monitor own home when on holiday, or second home

# Reduced energy bills and carbon footprint



- Savings on energy bills and CO<sub>2</sub> emissions can be achieved with real-time data alone - even without notifications or optimisation solutions.
- Delta-EE's review of trials concludes 5-15% savings in energy consumption with direct real-time feedback having greater impact than indirect feedback after data processing.
- This level of energy savings correlates with several in-market studies of real-time data users such as Sense, and Total Direct Energie.

# Higher quality of energy insights

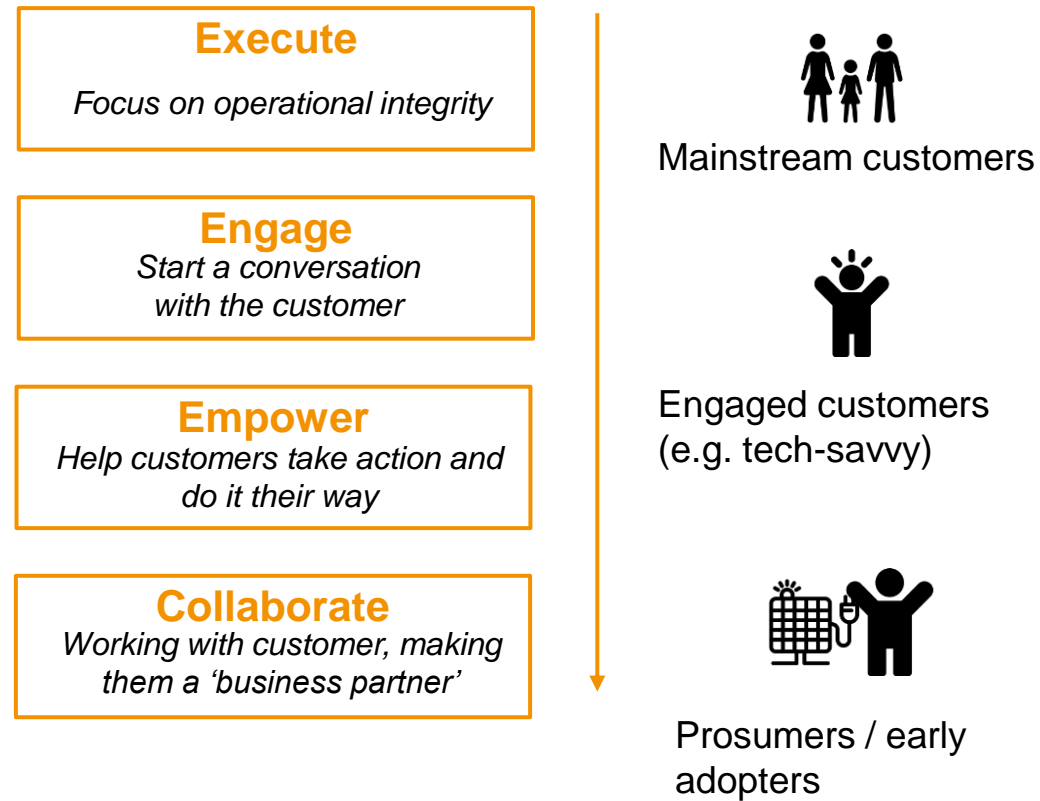


- **Device detection** – higher granularity enables better identification of load signatures for disaggregation.
- **Event detection** – high-resolution data can spot events such as light switches being turned on.
- **Interpretation** – the magnified lens helps AI models understand behaviours in the home and can better tailor insights, advice and notifications.
- **Enhancing smart meter data algorithms** –high-resolution data can be used cost effectively to improve smart meter data models.

Granularity, home awareness and energy engagement		
15-60 min data	1-10 sec data	<1 sec data
Example devices: Space heat, laundry, EV charging, lighting, refrigeration, entertainment, A/C, other	Additional devices: Kettle, oven, immersion heater, washing machine, fridge, dishwasher	50+ devices Stage or cycle of multi-state devices
Up to 70% accuracy	70-90%+ accuracy	95%+ accuracy (for 2 state devices)



# Energy customer engagement framework



# Leading real-time energy data use cases

Customer engagement framework	Use case
Customer engagement	Home awareness and monitoring
	Reduction of energy bills and carbon footprint
	Higher quality of energy insights
Customer empowerment	Fault detection and prevention
	Connected home and HEM
	Pre-pay
	Elderly care monitoring
Customer collaboration	EV smart charge optimisation
	Solar PV optimisation
	Automated and behavioural demand response

# Combines connected devices for home energy management



## Active players

Eneco

E.ON

geo

Schneider  
Electric

Greencom

tiko

- Real-time energy data improves the transparency and effectiveness of connected controls, such as for heating, lighting, etc.

- It provides the benchmark and guidance for home energy management from a cost-effective and resilient energy supply perspective.

- Real-time energy data can perform more sophisticated analysis and precise operations, thereby maximising the value of home energy management.

# Empowers pre-payment customers



## Active players

Chameleon  
Technology

geo

- Pre-pay represents over 10% of the residential markets in countries such as IE and the UK. It's an important segment that has greater need for real-time data.
- Pre-pay customers often operate within tight margins of energy consumption, credit balances & payment, and timeframes.
- Real-time data can overcome issues of data processing delays and inaccurate credit estimates, improving the customer experience.

# Leading real-time energy data use cases

Customer engagement framework	Use case
Customer engagement	Home awareness and monitoring
	Reduction of energy bills and carbon footprint
	Higher quality of energy insights
Customer empowerment	Fault detection and prevention
	Connected home and HEM
	Pre-pay
	Elderly care monitoring
Customer collaboration	EV smart charge optimisation
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# Enhanced EV charging propositions



## Active players

PodPoint

Jedlix

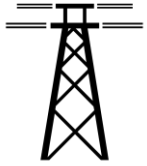
MyEnergi

Smappie

EO

- Some companies are considering EV home charging in a wider home energy eco-system such as:
  - home overload protection,
  - time-of-use costs factoring into EV charging schedule,
  - and solar PV source optimisation.
- Real-time energy data can thus help convey the cost of EV charging live in relation to the whole home, adding sophistication to standard EV charging options through visibility and AI.
- It can also offer bi-directional optimisation so the EV can provide electricity back to the home (not just the grid) at peak times.

# Optimises behavioural and automated demand response



## Active players

Octopus Energy

Voltaware

Voltalis

- As an implicit demand response mechanism, ToU tariffs can be improved by sending real-time data / notifications to help customers adapt energy use to maximise bill reduction benefits and consequently shift load peaks.
- Real-time disaggregation can further help customers identify and schedule the use of major electrical appliances.
- Real-time energy data enables the automation of data collection, decision making and implementation in the demand response process, thereby optimising automated demand response and improves grid load monitoring.

## Where do you see the greatest opportunity for real-time energy data today?

- a) **Customer engagement** (home awareness and monitoring, energy bill reduction, carbon footprint reduction, higher quality of energy insights, etc.)
- b) **Customer empowerment** (fault detection, connected home, HEM, elderly care, etc.)
- c) **Customer collaboration** (PV self-consumption optimisation, EV charging optimisation, demand response, etc.)



## Where do you see the greatest opportunity for real-time energy data in the next 3 years?

- a) **Customer engagement** (home awareness and monitoring, energy bill reduction, carbon footprint reduction, higher quality of energy insights, etc.)
- b) **Customer empowerment** (fault detection, connected home, HEM, elderly care, etc.)
- c) **Customer collaboration** (PV self-consumption optimisation, EV charging optimisation, demand response, etc.)

# Reflection on the 10 key use cases...

Customer engagement framework	Use case
Customer engagement	Home awareness and monitoring
	Reduction of energy bills and carbon footprint
	Higher quality of energy insights
Customer empowerment	Fault detection and prevention
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	Elderly care monitoring
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# Energy Insights+ recent publications

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## GAMIFICATION AND ENERGY INSIGHTS

HOW CAN GAMIFICATION HELP DEVELOP ENERGY INSIGHTS SERVICES TO DRIVE ADDITIONAL CUSTOMER ENGAGEMENT?



## RESIDENTIAL ENERGY INSIGHTS MARKET

HOW FAR HAS THE MARKET COME AND HOW WILL IT EVOLVE?



ENERGY INSIGHTS +  
USAGE AND ATTITUDES  
EUROPEAN CUSTOMER RESEARCH

## Research reports

*Next report: Commercial value of energy insights*

## Databases

### Smart meter solutions database

ENERGY INSIGHTS +

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www.delta-ee.com

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Contact: [david.bradford@delta-ee.com](mailto:david.bradford@delta-ee.com)  
[zuzanna.zhang@delta-ee.com](mailto:zuzanna.zhang@delta-ee.com)

**Methodology** This database highlights a list of innovative businesses that Delta-EE has identified through its research that are using smart meter data to change relationships between energy pr  
They have been investigated through primary and/or secondary research and concisely summarised to provide short, informative, digestible synopses of their business model and  
The business models have then been allocated into one of Delta-EE's smart meter data categories: 'usage, engagement, collaboration'. This highlights the type of relationship being pr  
Where a profile of the company has been created within the Digital Customer Engagement service, a hyperlink is provided. Depending on your configuration, it may be necessary t  
The database encompasses the smart meter data that will influence customer relationships.

AGL, Advizzo, BeeData Analytics, BEN Energy, Bidegly, British Gas, Datanumia, EDF, EDF UK, Edison, EDP, Eestie Energia, Electric Ireland, Endesa, Eneco, Engie Electrabel, E.ON SE, E.ON UK, Eliq, Engie, Essent, EWE, Fludia, Fortum, Fresh Energy, GenGame, GreenYellow, Grid4C, GridPocket, HomePulse, Horizon Power, Iberdrola, Innogy, Innowatts, NET2Grid, Onzo, Oracle, OVO Energy, Oxxio, Schneider Electric, Seas-NVE, Scottish Power, Sense, Sowee, Smappee, Total Direct Energie, Uplight, Vattenfal SE, Vattenfall NL, Verv, Voltaware...

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### Series 9 Episode 7: Transactive Energy: what is it and what does it mean for distribution network companies?

Transactive Energy is a term that's emerged in the last years, but what does it actually mean, how is it emerging, and what does it mean for distribution networks? In today's episode, host Jon Stowe is joined by Gerben van den Berg, Senior Consultant in Strategy and Corporate Development for Alliander, a distributor of gas, electricity and heat in the Netherlands and Germany; and Delta-EE expert Jeremy Harrison, who leads our Local Energy System research.



View Transcript



### Series 8 Episode 7: New Energy - What do customers think?

Customers will be at the heart of much of the energy transition. No longer does the boundary of the energy system end at the meter: EVs, heat pumps, batteries and flexible loads will all play a big role in services to customers and the energy system. In this episode we will take a look at customers needs and wants, how they react to certain propositions, and we also look at highlights of Delta-EE's customer research. Host Jon Stowe is joined by Delta-EE experts, David Trewhick and Ludovica Di Deodato.



View Transcript

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