IEA DSM Task 17
Phase 4: Responsive Prosumer Networks
ExCo Meeting Dublin, May 11th 2017

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Task 17; Integration of Demand Side Management, Energy Efficiency, Distributed Generation and Renewable Energy Sources (previous phases)

- Phase 1 (VTT: 2008-2010): Information collection on technologies and analysis
- Phase 2 (VTT: 2011-2013): Projects inventory, qualitative analysis and maturity assessment
- Phase 3 (AIT/TNO 2014-2016): Potentials, business models and quantitative analysis (US, Copper Alliance, S, CH, A, NL)

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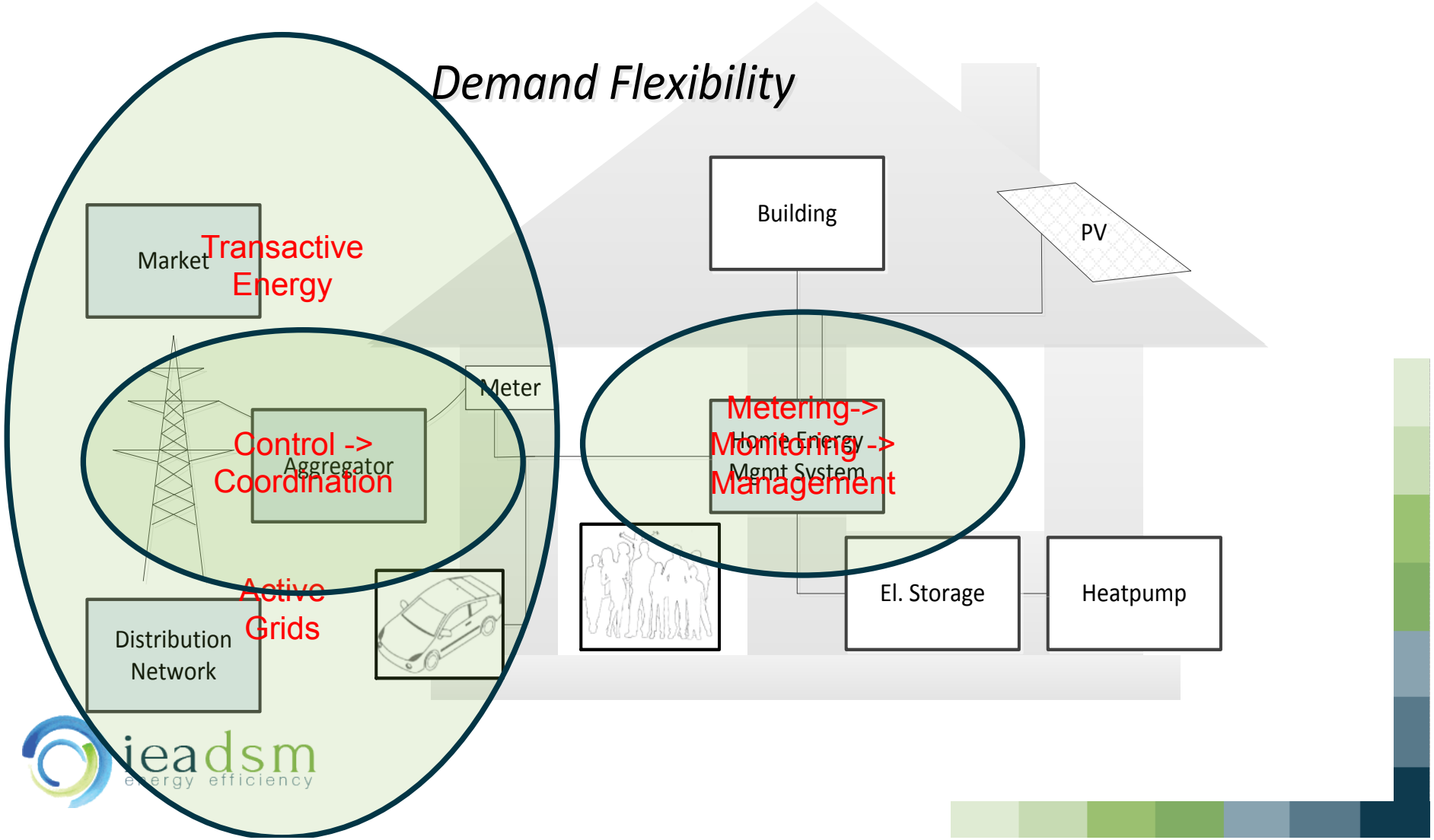
Overview: Deployment view : one step further



Phase 4; Demand Side Management -> Integration

• Metering	-> Monitoring	-> Context awareness
• Control	-> Coordination	-> Participation
• Passive	-> Active grids	-> Pre-emptive grids
• Tariffed	-> Microtransactions	->Transactive Energy

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Responsive via incentives

- Metering -> Monitoring
- Control -> Coordination
- Passive -> Active grids
- Fixed Tariffs -> Flexible tariffs

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Prosumer (Producing consumer <> Buying supplier)

- Consumption -> Net supplier
- Supplier -> Net consumer
- System operator -> Active assets in grids
- Aggregator -> Intermediate between parties; solves everything; at regional level

Smart Cities, communities

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Networks

• Operation mode:	Top-down	-> More bottom-up
• Investments:	Asset driven (30+ y)	-> Risk driven (10-15 y)
• Tariffs	Capacity (max. kW/y)	-> Real time (kW(t))
• Monitoring	Primary substation	-> Secondary substation

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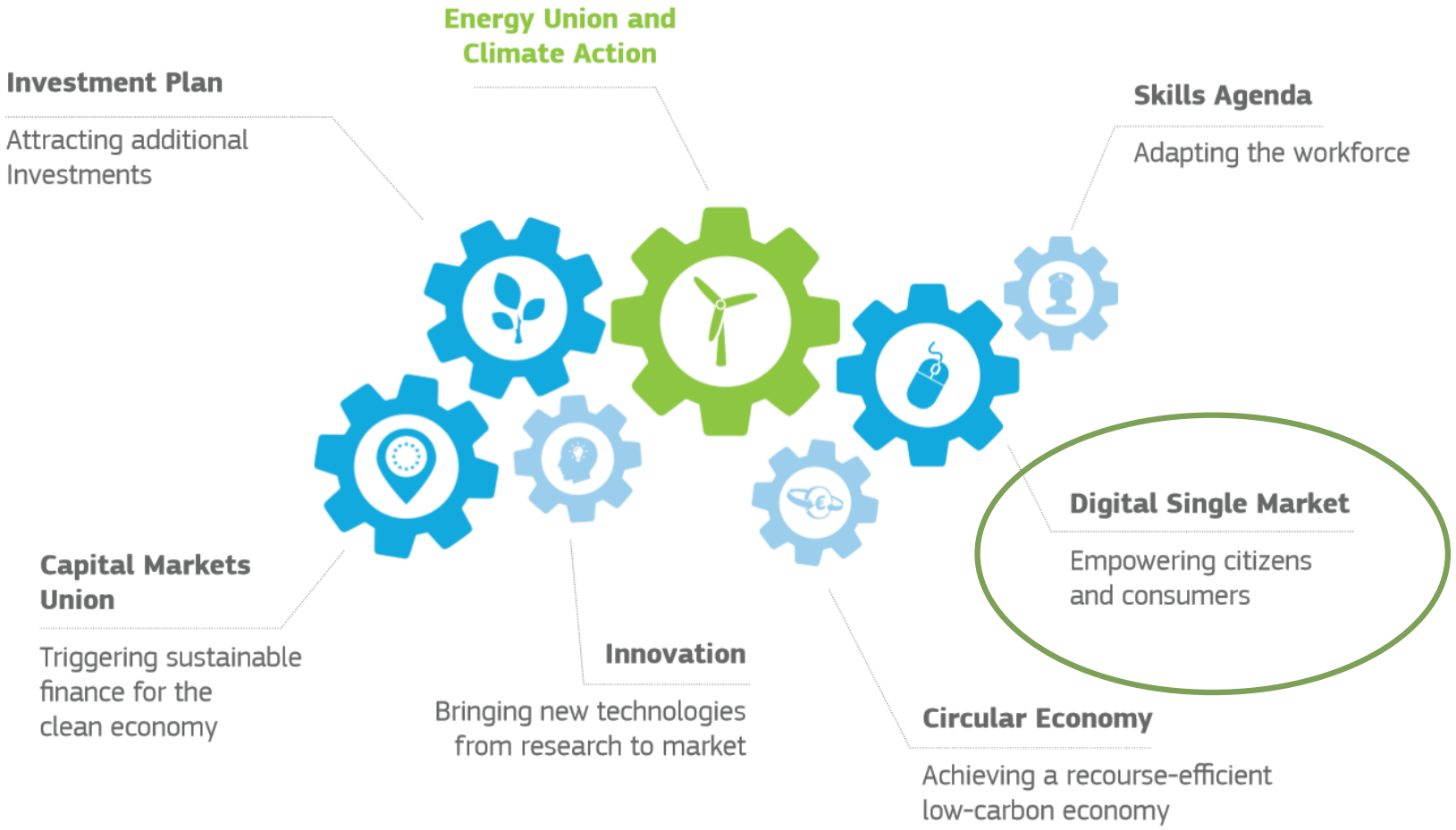
Subtask 14: Context EU winter package



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Subtask 14: Context EU winter package 2016

Some consumers – as individuals or in cooperatives – already generate renewable electricity, self-consuming, storing or even selling energy to the grid. We want to make this possible for everybody who wishes to produce their energy at home.

Consumers who produce energy still face **too many barriers**: they are either not allowed to feed their electricity back to the grid or when forced to do so they get a poor deal.

We want to **break those barriers** by making the whole system less burdensome, more flexible and more responsive to the way consumers produce and consume.

It is central that consumers can trust the energy policies and services. We want to increase transparency in the energy costs and prices. The current situation wherewholesale prices for electricity and gas are close to their lowest levels in a decade, yet retail prices for households have increased by about 2-3% per year since 2008, is not conducive to active energy consumers and needs to change.

The reality is that for most people their only interaction with the energy supply is when they have to pay their bill or deal with a problem. We want to change this. With our proposals **Europeans will have better access to smart meters and clear bills, and will be better able to switch energy provider**. We want Europeans to have better information, more possibilities to engage in the energy market and to be more in control of their energy costs.

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Subtasks

- Subtask 14:
  - Context analysis, use cases and Smart City pilots positioning
- Subtask 15:
  - Metering, monitoring and coordination methods required to increase prosumer responsiveness
- Subtask 16:
  - Coupling to innovative user feedback, billing and transactive energy schemes
- Subtask 17:
  - Conclusions and Recommendations

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Subtask 14 : Context analysis, use cases and Smart City Pilots

- Energy transition
  - electricity: commodity, dissatisfier -> asset, gadget, part of life style
- Digitalization
  - Information available anywhere, anytime
  - Software or hardware cost no longer major issue
- Value creation <> unburden (D: entsorgen)
  - Mapping roles and responsibilities
- Define the existing context, common practices and state-of-the-art in the sector as-a-whole and on a per-country basis
- Analyze and refine the role and level of aggregator and aggregation in common use cases
- The Smart city metaphor
  - EU and national
- Bottlenecks in upscaling successful pilots
  - Increase technology readiness levels

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Subtask 15 : Metering, monitoring and coordination methods required to increase prosumer responsiveness

- Develop view on how to come to a better mapping of commercial tariffs on DR and DG customer behavior
- Make inventory on current and future distribution grid asset management, operation modes and associated tariff scheme components
- Develop view on possible new tax and subsidy schemes
- Assess the relation to already existing and future automated control schemes

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Subtask 16 :Coupling to innovative user feedback, billing and trans-active energy schemes

- Make an inventory of existing feedback, reconciliation and billing systems for electricity
- Assess a number of pilots, that have been implemented on micro-transaction based approaches
- Develop common view on feedback and billing innovation

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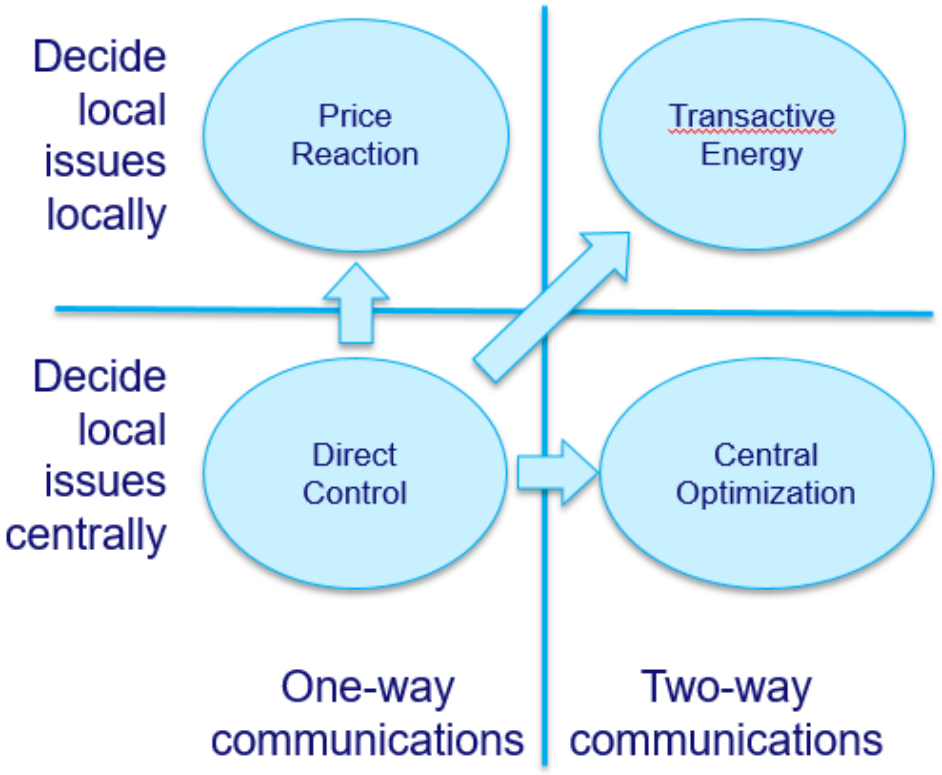
Subtask 16 : Transactive energy

- **Direct (Top-Down) Control**
  - **Utility switches devices on/off remotely**
  - **No local information considered**
- **Central Control/Optimization**
  - **Optimization and control from a central point**
  - **Relevant local information must be communicated to central point**
- **Price Reaction Control**
  - **Prices signalled to customers and/or their automated devices**
  - **No communication of local information**
- **Transactive Energy (TE)**
  - **Automated devices engage in market interactions**
  - **Information exchange includes quantity (e.g., power, energy) and price**



Subtask 17 : Conclusions and Recommendations

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Collaborations

- IEEE, IEC and CENELEC standards committees
- ISGAN (SmartGrids)
  - Several annexes
- National stakeholder groups
  - NL/TKI Urban energy
- IEA/TCP
  - ECES (Storage)
  - HPT (Heat pumps)
  - PVPS (photovoltaic)
- IEA/DSM tasks:
  - Task 16 Innovative energy services
  - Task 23 The Role of Customers in Delivering Effective Smart Grids
  - Task 24 Closing the Loop – Behavior Change in DSM: from theory to policies and practice
  - Task 25 Business models for a more effective market

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Organization

IEA-DSM TASK 17 - Phase 4	Q3 17	Q4 17	Q1 18	Q2 18	Q3 18	Q4 18	Q1 19	Q2 19
Subtasks								
Subtask 14 - Context								
Subtask 15 - Metering, monitoring and billing								
Subtask 16- Billing and transactive								
Subtaks 17 - Conclusion and recommendations								
Expert meetings								
Biannual country expert meeting								
Workshops								
Workshops with stakeholders and experts								
Reports								
Subtasks reports								
Final report								

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Deliverables

- IEA-DSM-17.4.14: “Context analysis, flexibility aggregation and Smart City initiatives”
- IEA-DSM-17.4.15: “Metering, monitoring and coordination methods required to increase prosumer responsiveness”
- IEA-DSM-17.4.16: “Innovative user feedback, billing and transaction schemes”
- IEA-DSM-17.4.17: “Conclusions and recommendations realizing responsive prosumer networks”

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Financial

- Dependent upon the number of participating countries (>4); 32-24k€
- In kind country expert contribution 200-300 hrs over 2 years

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Questions

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Energy efficiency program
Monitoring and control systems

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