IEA DSM Task 17

Phase 4: Responsive Prosumer Networks

ExCo Meeting The Hague, October 5th 2017

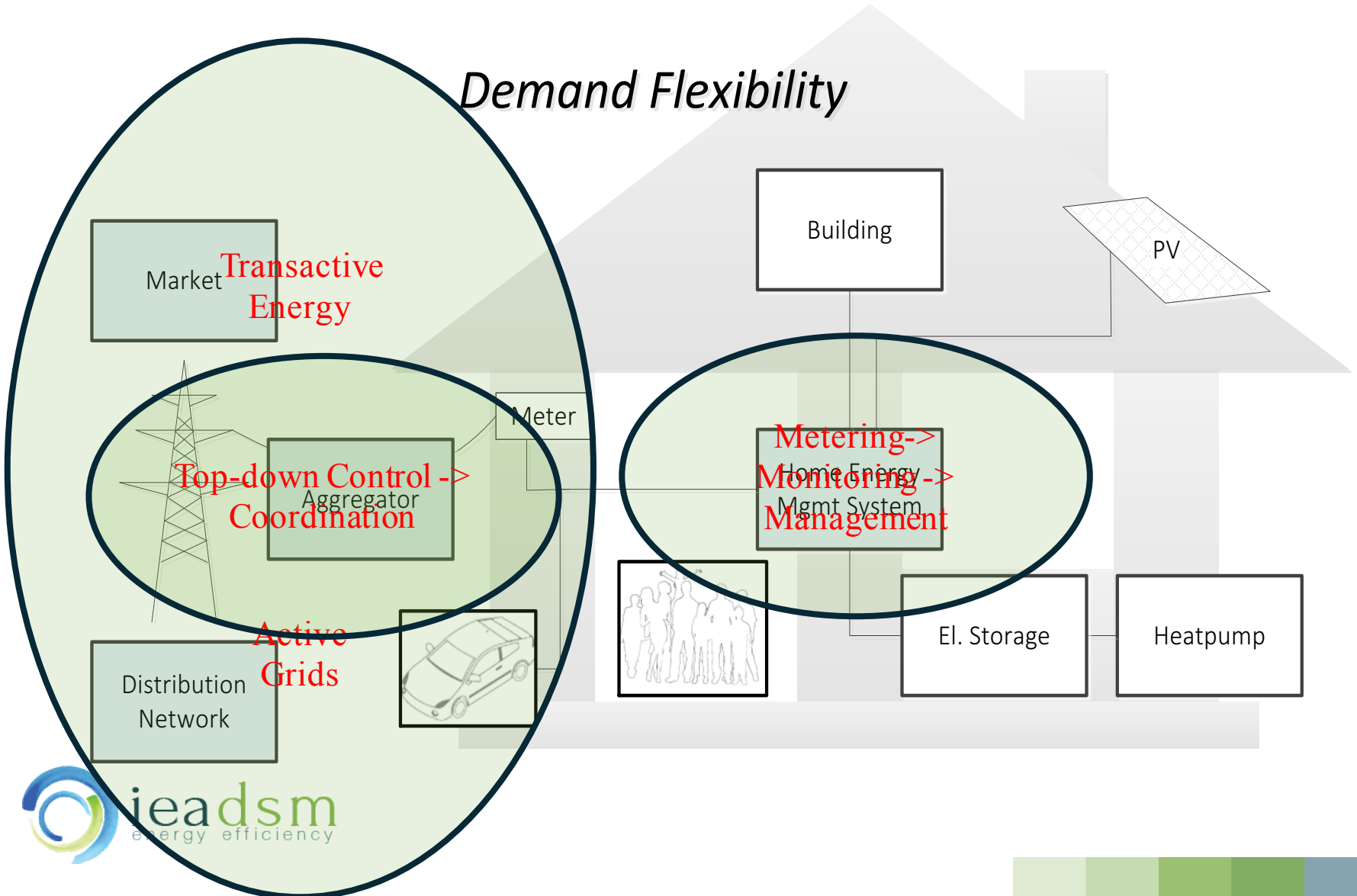
René Kamphuis, TNO and TU Eindhoven

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)

ieadsm
energy efficiency

Overview: Deployment view : one step further



ieadsm
energy efficiency

Phase 4; Demand Side Management -> Integration

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

ieadsm energy efficiency

Responsive via incentives

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

ieadsm
energy efficiency

Prosumer (Producing consumer <> Buying supplier)

- Consumption -> Net supplier
- Supplier -> Net consumer
- System operator -> Active assets in grids
- Aggregator -> Intermediate between parties

More responsibilities at the regional level

- Smart Cities,
- Smart communities

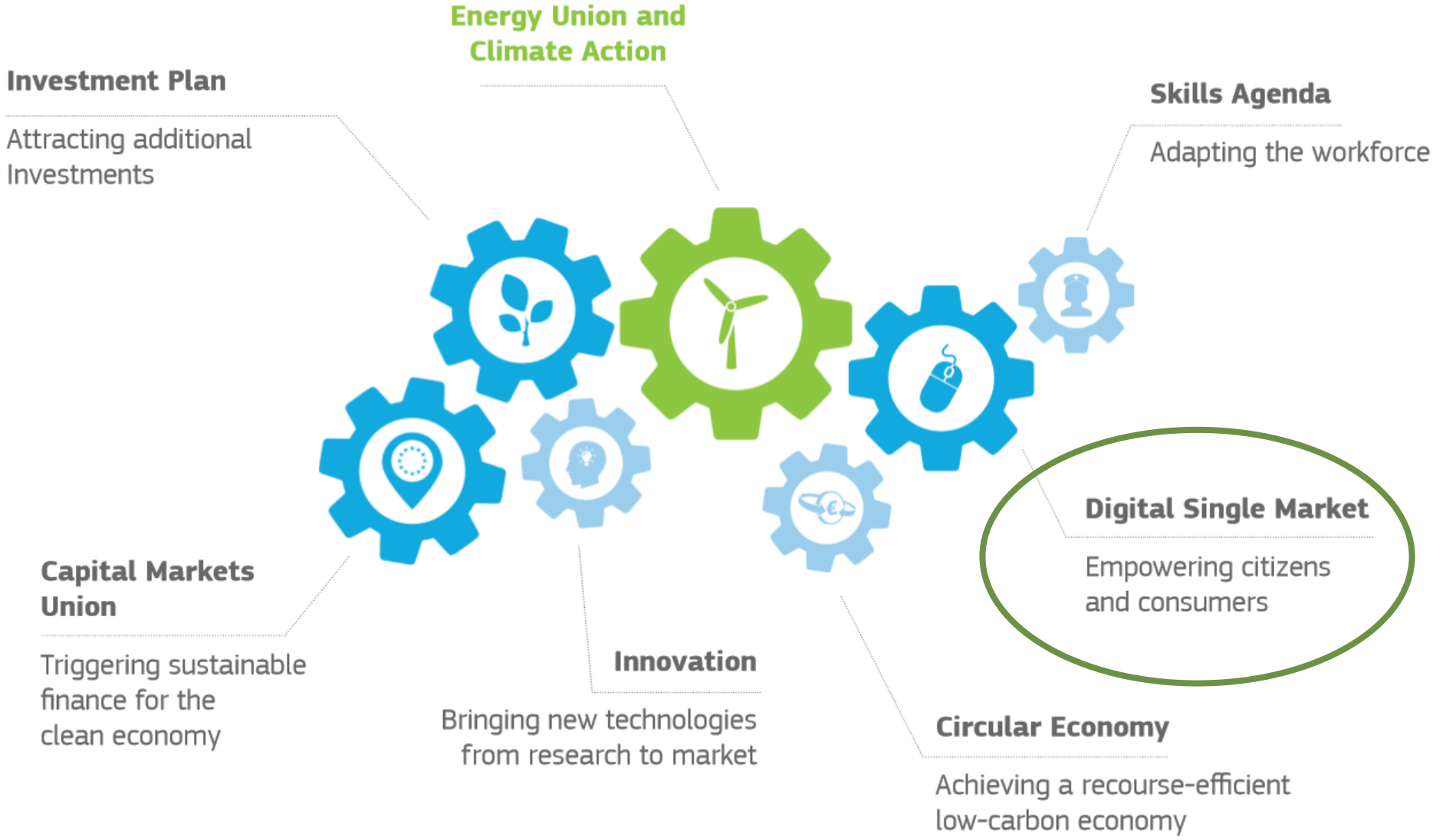
ieadsm energy efficiency

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

ieadsm
energy efficiency

Subtask 14: Context EU winter package



Subtask 14: Context EU winter package 2016

Some consumers – as individuals or in cooperatives – already generate renewable electricity, self-consuming

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

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.

ieadsm energy efficiency

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

ieadsm
energy efficiency

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
- Critical success factors for smart grid projects
- Bottlenecks in upscaling successful pilots
  - Increase technology readiness levels

ieadsm
energy efficiency

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
- How do prosumer assets (including storage) become available for other actors
- 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

ieadsm
energy efficiency

Subtask 16 :Coupling to innovative user feedback, billing and transactive energy schemes

- Make an inventory of existing feedback, reconciliation and billing systems for electricity
- Assess a number of pilots, that have been implemented alternative approaches
- Develop common view on feedback (50% kWh/50 flex) and billing innovation (e.g. Ethereum/smart contracts)

ieadsm
energy efficiency

Subtask 17 : Conclusions and Recommendations

- Lessons learned

ieadsm
energy efficiency

Collaborations

- IEEE, IEC and CENELEC standards committees
- ISGAN (SmartGrids)
  - Several annexes
- National stakeholder groups
  - NL/TKI Urban energy
- EERA/SmartGrids
- DERLabs HESI-facility
- IEA/TCP
  - ECES (Storage)
  - HPT (Heat pumps)
  - PVPS (photovoltaic)

ieadsm energy efficiency

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								

ieadsm
energy efficiency

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"

ieadsm
energy efficiency

Financial

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

ieadsm
energy efficiency

Questions

TNO Netherlands organization for science and technology

René Kamphuis, Anna Kosek

Energy efficiency program
Monitoring and control systems

Eemsgolaan 3,
9727 DW Groningen
T +31 (0) 621134424
PO Box 1416
9701 BK Groningen
The Netherlands
rene.kamphuis@tno.nl
www.tno.nl

ieadsm energy efficiency