MAIN FINDINGS OF THE PHASE 1 AND SCOPE OF THE PHASE 2 STUDY

Phase 1 study – goals

- Analyse the following aspects with a view to a broad introduction of smart appliances:
  - technical,
  - economic,
  - market, and
  - societal

- Develop adequate policy approaches supporting the broad introduction of smart appliances.

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Phase 1 study – definition

- Definition of a smart appliance = ENERGY SMART APPLIANCE (was DSF enabled appliance)
  - An appliance that is able to automatically respond to external stimuli e.g. price information, direct control signals, and/or local measurements (mainly voltage and frequency).
  - The response is a change of the appliance's electricity consumption pattern. These changes to the consumption pattern are what we call the 'flexibility' of the smart appliance.

- Name is now in line with the new energy labelling framework

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Phase 1 study – scope

- Identification of potential of different energy smart appliances – 3 groups:
- **High flexibility potential with few comfort and/or performance impacts**: dishwashers, washing machines, washer dryers, buffered water heaters, radiators, boilers, heat pumps, circulators, residential and non-residential air conditioners and battery storage systems
- **Smaller flexibility potential and/or larger comfort/health impacts**: tumble dryers, refrigerators, freezers, extraction fans, heat recovery ventilation and air handlings units and chargers (low power);
- **Only emergency flexibility potential**: electrical hobs, ovens, hoods, vacuum cleaners and lighting.

Phase 1 study – approach

- Definition of environmental and economic impacts
  - On an appliance level (interoperability, functionality,…)
  - On the system level (by providing the flexibility through different system use cases/business cases) = KPIs:
    - CO2 emission savings;
    - the primary energy savings and efficiency of the utilized generation mix;
    - savings in total energy system costs and marginal energy prices.
- Quantification of the system benefits → dedicated model for 2014, 2020, and 2030 for 2 scenarios (BAU and 100%)
- System benefits are later translated to the appliance benefits

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Phase 1 study – main conclusions (1)

- Flexibility from energy smart appliances can support the energy system in many ways:
  - optimize the planning in day-ahead scheduling
  - balance the production and consumption in real time
  - prevent curtailment of renewable energy in the system with limited transmission capacity (maximize self-consumption)
- resulting in positive impact on all defined KPIs and creating value for all the consumers (not only owners of energy smart appliance)

- Theoretical monetary benefits for providing flexibility per energy smart appliance goes as high as 120 €/year/appliance, depending on the scenario, year, and the appliance.

Phase 1 study – main conclusions (2)

- The appliances will only need very limited additions of electronic circuitry and other components.

- Very difficult to derive generalised estimations of the additional investment costs that can only be attributed to the energy smart feature.

- The operating costs related to in-house communication infrastructure can be assumed negligible (shared with other devices).

Phase 1 study – gaps

- The need to include chargers for electric cars in the preparatory study and to explore their technical potential and other relevant issues in the context of demand response → emphasized and requested by the stakeholders
- The modelling has so far not systematically included the EEA-countries. → requested by the stakeholders
- Interoperability explored and monitored by the study is more complex than expected → more analysis requested by the stakeholders
- Elaboration of the policy approaches identified and developed in the preparatory study (phase 1)

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Phase 2 study – goals

- What is the technical potential and economical/environmental effects of the energy smart appliances in Norway, Iceland, Switzerland and Lichtenstein?
- What is the technical potential of electric chargers in EU and EEA countries in the context of demand response as defined in the phase 1 of the study?
- What are other relevant issues related to electric chargers and electric vehicles in the context of demand response?
- How can the policy options set as identified during the Phase 1 be deepened, regarding aspects such as:
  - Feasibility and practical implications of horizontal requirements,
  - Options to adapt policy approaches to different product groups,
  - Design options and implications for product-specific implementing measures,
  - Possibilities to disclose and promote interoperability?

Goal and agenda of the meeting

Programme	
9:30 - 10:00	Welcome coffee/tea and Registration
10:00 - 10:15	**Opening of the workshop** *Robert Nuij and George Paunescu, European Commission DG Energy*
10:15 - 10:35	**Main findings of phase 1 and scope of the phase 2 study** *Ana Virag, VITO/EnergyVille*
10:35 - 11:35	**Economic impact of energy smart appliances in the context of the broadened scope of the study** *Ana Virag, VITO/EnergyVille*
11:35 - 11:50	Discussion
11:50 – 12:15	**Policy approaches and set of proposed policy options for energy smart appliances** *Jan Viegand, Viegand Maagøe A/S*
12:15 - 12:30	Discussion
12:30 - 13:30	Lunch
13:30 - 14:25	**The context and strategic decisions for the development the policy options** *Jef Verbeeck, VITO/EnergyVille*
14:25 – 15:05	**Set of policy options for energy smart appliances (part 1)** *Jef Verbeeck and Koen Vanthournout, VITO/EnergyVille*
15:05 - 15:20	Discussion
15:20 - 15:40	Coffee Break
15:40 - 16:20	**Set of policy options for energy smart appliances (part 2)** *Jef Verbeeck and Koen Vanthournout, VITO/EnergyVille*
16:20 - 16:50	Discussion
16:50 - 17:00	**Closing of the workshop** *Ana Virag, VITO/EnergyVille*