

# EV0419

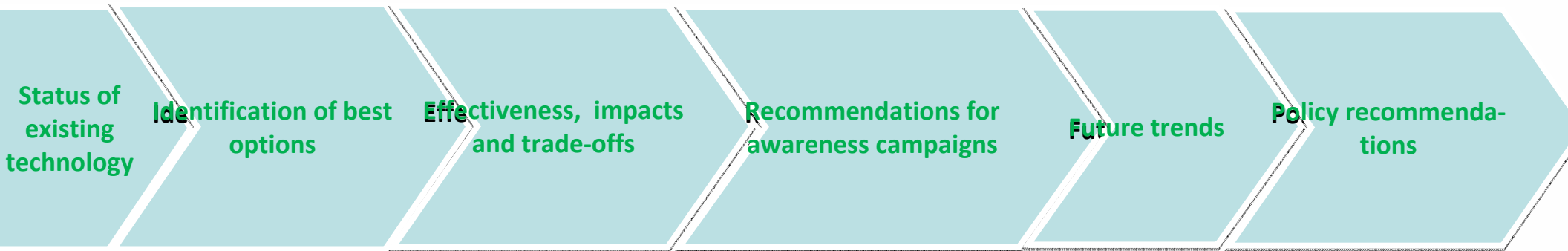
## Reducing the environmental impacts of clothes cleaning

20 February 2009

**BIO IS:** Aymeric Schultze, Shailendra Mudgal

# EV0419 objectives

- ▶ To identify **improvement options**, **trade-offs** and **policy directions** to reduce the impact of clothes cleaning, using a **fact-based life-cycle approach**



# Areas and technologies investigated

- ▶ Areas assessed include:
  - ▶ **Fibre** and **fabric** characteristics
  - ▶ **Washing** and **drying** appliances
  - ▶ Low/non-solvent **dry cleaning**
  - ▶ **Detergents** and their packaging
  - ▶ Sustainable **building design**
  
- ▶ Technologies are being investigated through different perspectives:
  - Technical maturity, market status and trends
  - Environmental impacts and tradeoffs
  - Effectiveness in relation to consumer behaviour

- ▶ Technologies investigated cover:
  - **Common fibre characteristics** and technologies affecting them
  - **Easycare** fabrics (anti-stain, anti-bacterial, quick-dry, anti-crease)
  - **Dye permanency** and **durability** of garments
  
- ▶ Impacts of washing and cleaning, from a fibre/garment perspective, are related to:
  - Fibre characteristics (required washing temperature, creasability...)
  - Clothes' durability
  - User perceptions and behaviours that affect care frequencies and practices

- ▶ Clothes cleaning appliances investigated include:
  - **Washing** machines
  - **Drying** appliances (several drying mechanisms and drying cabinets)
  - **Combined washing** and **drying** machines
  - Clothes **irons**
  - **Washing gadgets** (polymer pellets, ozone treatment,...)
  - **Alternative approaches** (commercial laundry and outdoor line drying)
- ▶ Environmental impacts of appliances are mostly due to :
  - Energy consumption
  - User behaviour (washing temperature, ironing time,...)

- ▶ Technologies covered include phosphate and phosphate-free detergents, as well as low temperature detergents
- ▶ The environmental impacts of detergents are mainly related to:
  - Chemicals
  - Dosage (and hence to user behaviour)
  - Packaging

- ▶ Several alternatives to traditional perchloroethylene (PERC) systems are being assessed:
  - **Alternative solvent** dry cleaning systems
    - Petroleum-based (DF-2000,...)
    - Silicone-based (Green Earth)
    - Hybrid (Pure Dry)
    - And others (Rynex, Jet Clean, Drysolv,...)
  - **Water**-based systems (Green Jet, Icy Water)
  - **CO<sub>2</sub>**-based systems (, Solvair...)
  
- ▶ Main issues in relation to environmental impacts include:
  - Energy and solvent consumption
  - Solvent characteristics (toxicity, emissions,...)

- ▶ Sustainable building design may also affect washing and drying practices and impacts. Three areas are under investigation:
  - **Reducing water hardness** as mineral deposits can affect machinery and clothes; water could be softened at supply
  - **Grey water systems** could reuse waste water from clothes cleaning (particularly for gardens)
  - **Drip drying** can limit the impacts of the drying stage

- ▶ **Accessing detailed manufacture data to assess environmental benefits and trade-offs**
  - Protection of proprietary technology
  - Risk to manufacturer of their technology having more environmental impact than benefit
- ▶ **Integrating social data**
  - Many options rely on behaviour change, for which data is difficult to assess
  - How to educate public on good practice in clothes cleaning?

## Closing remarks