

## MARKET/BUSINESS MODELS




Koen Vanthournout, VITO




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## End consumer business models

- » A **wide variety of business models** for the end consumer are possible
  - » Variable pricing
  - » Capacity/activation fee
  - » PV injection minimization
  - » Energy services bundle offer
  - » Rebate or subsidy scheme at purchase
  - » Obligatory




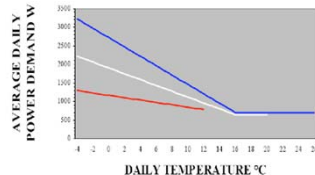
- » Smart appliances should accommodate as many as possible
- » Limited public available information




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## Variable pricing

- » Vattenfall/Sweden
  - » Retail contracts with Nordic power exchange based hourly prices
- » France Option Tempo
  - » Blue, white and red days
- » Eneco SlimLaden/Netherlands
  - » Smart charging of Tesla's based on energy market prices








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## Variable pricing – research project experience

- » Linear:
  - » 6 fixed time blocks per day with variable prices set per day
  - » Variable pricing with automated control works well, but non-controlled (peak) loads represent financial risk
  - » Too complex for manual demand response (response fatigue)
- » PowerMatching city Hoogkerk
  - » Automated control preferred over manual control
  - » No response fatigue for manual control, as fixed price patterns render price consultation redundant



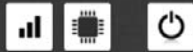


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## Capacity/activation fee

- » Traditionally used for balancing reserves
- » Typically used for industrial demand response based reserves
  - » R3-DP and SDR products of Elia in Belgium
  - » FCDM and STOR of National Grid in the UK.
  - » ...
- » Load management program for airco's in the US (FPL, BGE, ...)
- » Research project experience: Linear
  - » Capacity fee was well received by users: simple, no financial risk

Flexibiliteit:	Week	23,32 uur	€ 0,58
	Maand	139,52 uur	€ 3,49
	Totaal	2564,63 uur	€ 64,12



## Other examples

- » PV injection minimization
  - » Feed in tariffs for PV production in Germany and Belgium
- » Free thermostat or thermostat rebate in exchange for airco control (Austin Energy and CPS Energy in Texas, US)



## Call for information

- » Important that no revenue model is excluded
- » Limited public information
- » What are your experiences on business and remuneration models for smart appliances?

