



# Smart Metering Privacy: New Technology Dilemmas

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# Summary

- 1 New applications & privacy
- 2 Ubiquitous connectivity & its consequences
- 3 Smart metering privacy, policy, technology
- 4 Questions?

# Trust & Privacy

## What is trust?

- For the purpose of this presentation, trust establishment is a procedure proving to the satisfaction of the interested parties that certain behaviors are expected under given circumstances

## What is privacy? (Alessandro Acquisti)

- Freedom to develop (Scoglio 1994)
- Aspect of human dignity (Bloustein 1964)
- Right to be left alone (Warren and Brandeis 1890)
- Ability to control own *space* (Sweeney 2002)
- Tort (Prosser 1960)
  - Disclosure of intimate facts
  - False light
  - Misappropriation
  - Intrusion into somebody's solitude
- Ability to control access to one's information (in/out) (Noam 1996, Samarajiva 1998 – among many others)

# New Technologies and Privacy

## New attacks

- New technologies and usages are frequently associated with unexpected and unintended vulnerabilities

For new, evolving usages it may be unavoidable

## Evolving perceptions of privacy

- Each new usage model contributes to a very gradual evolution of fundamental requirements

## Evolving complex ecosystem

- Very few processes and usages today are NOT cross domain leading to underlying complexity of privacy requirements

# Universal connectivity and the home

## Proliferation of connected devices

- Home computers, smart phones, tablets, iPods, wireless pedometers, e-Readers, home monitoring devices, smart meters, visitors' devices...

## "Devices that tell on you"

- Studies show unintentional information leakage in devices and applications is not unusual

## Multiple devices work together

- Interoperability and convergence have created a new environment with new privacy attack vectors

# Smart Metering Privacy: Some Concerns

## Meters-utilities communication

- Information could be shared without users knowledge or it could be

Technology and policy solutions can resolve many issues

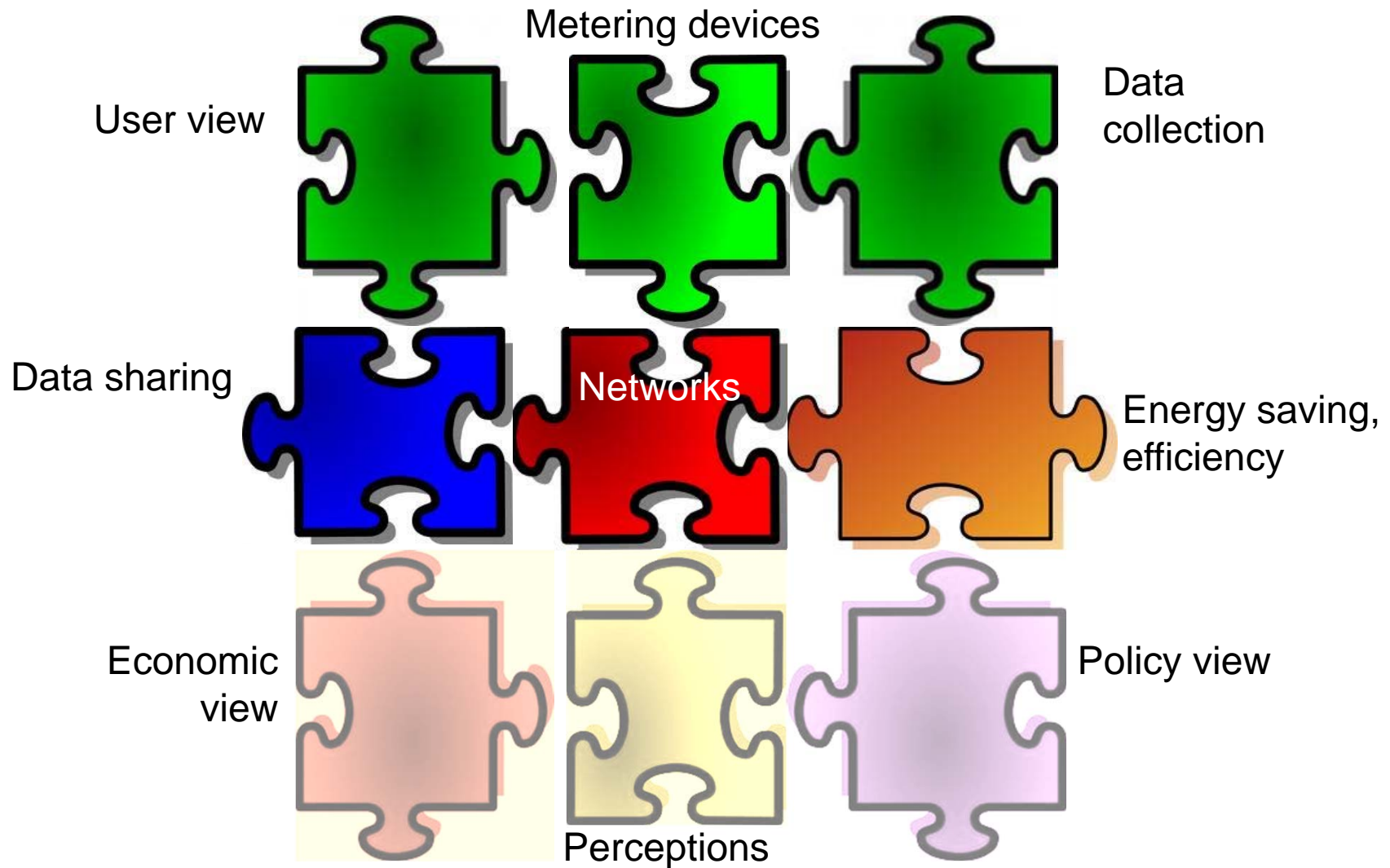
## Flexible billing and tariffs

- Information about usage patterns can become available

## Use of metering data for forecasting

- Usage data to be utilized without authorization and user awareness

# Smart Metering Puzzle



# Technology & economic considerations

- Many privacy issues in smart meters and smart grid areas can be resolved or mitigated by technology solutions
  - Within the limitations imposed by the usages that it will be necessary to support
    - Some of the usages anticipated today will never materialize
- As mass deployments are anticipated, economic considerations will be important in establishing privacy friendly models
  - Sophisticated economic studies in smart grid area should be encouraged



# Policy position

- Privacy and security are fundamental to developing trust in the global digital infrastructure, enabling the effective use of digital devices and services, including Smart Grid
- General privacy legislation can address issues relating to Smart Grid implicitly, and specific Smart Grid legislation or statute language is unnecessary

## Policy position (continued)

- The development of Smart Grid infrastructure should follow the principles of Privacy By Design and Accountability, where privacy requirements are taken into account early on and throughout the development lifecycle and where entities take responsibility for the information they collect
- Individuals have important rights in how information about energy in their homes is collected, processed and used
- Individuals should have the choice to manage their home energy needs through self-purchased services/devices or Home Energy Management Systems

**THANK YOU!**