

Smart Grid Systems: Privacy and Security Issues

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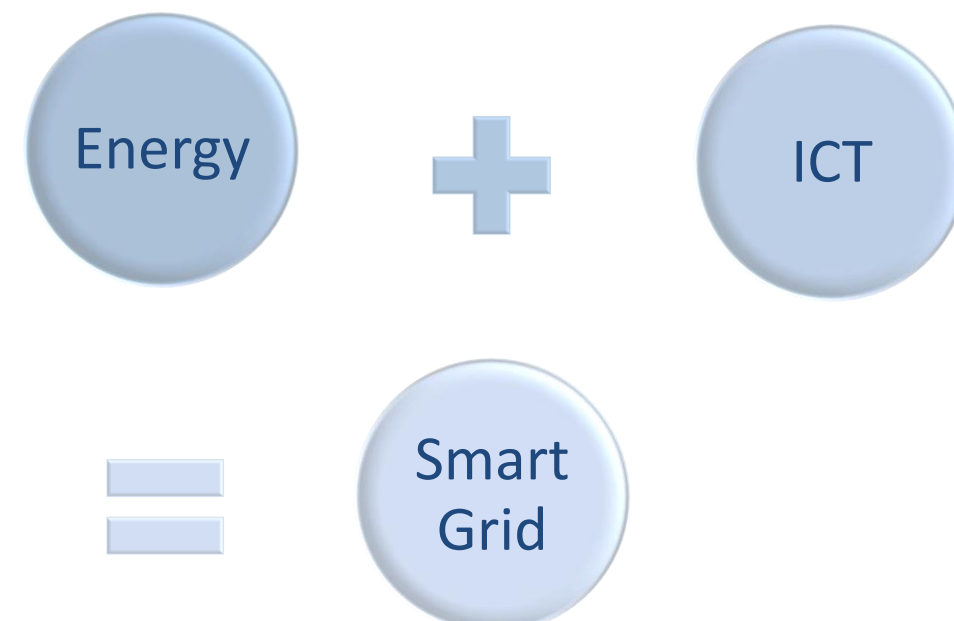
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1 What is a Smart Grid System

The development of technology able to provide full-fledged infrastructure for the lifecycle management of energy resources

Main Stakeholders

- Consumers
- Energy Suppliers
- Energy Service Companies
- Generation Companies
- Transmission System Operator
- Distribution System Operator
- Network Operators

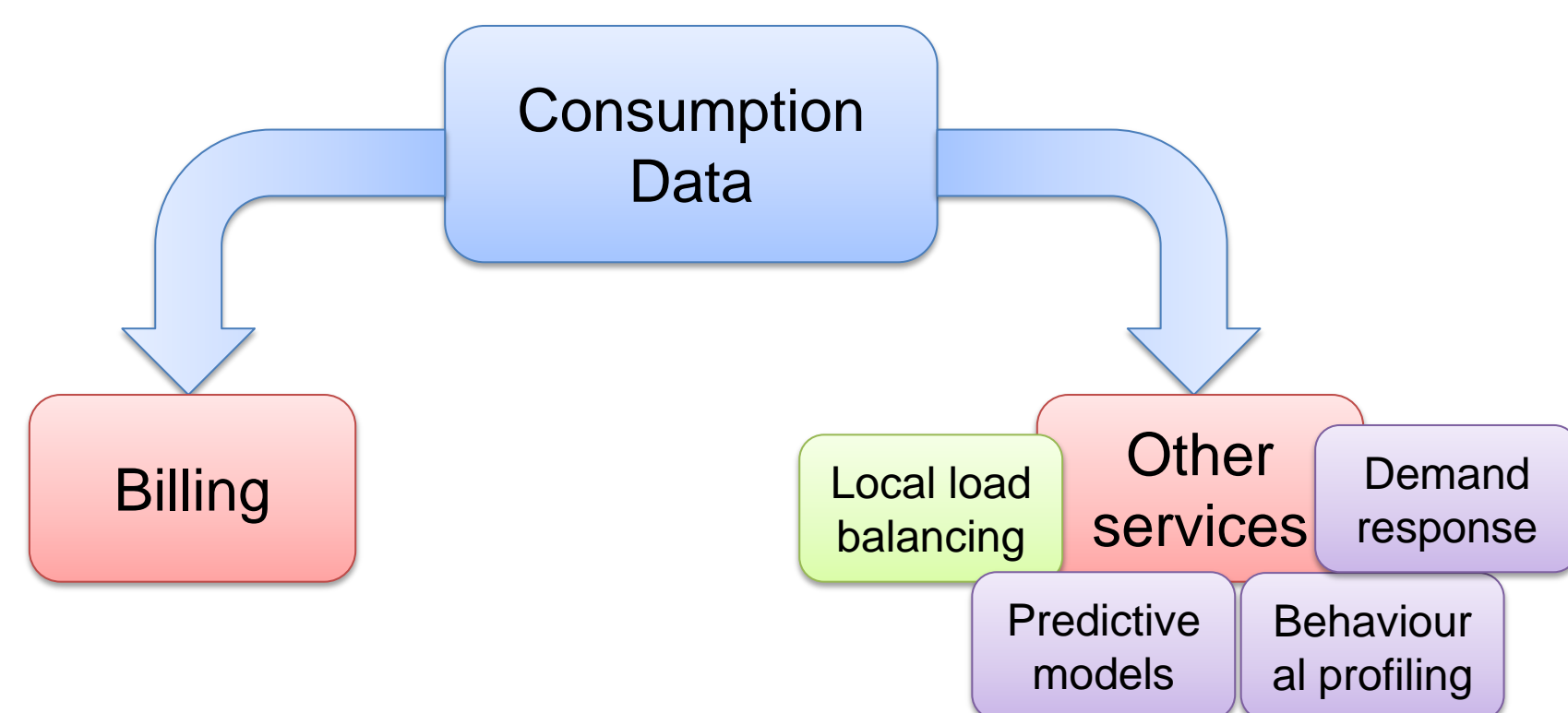


Key Components

- Energy Transmission and Distribution Infrastructure
- Data Communication Network
- Network and Home Gateways
- Smart Meters
- Smart Appliances
- Monitoring Modules
- Energy Generators and Stores
- Data Stores



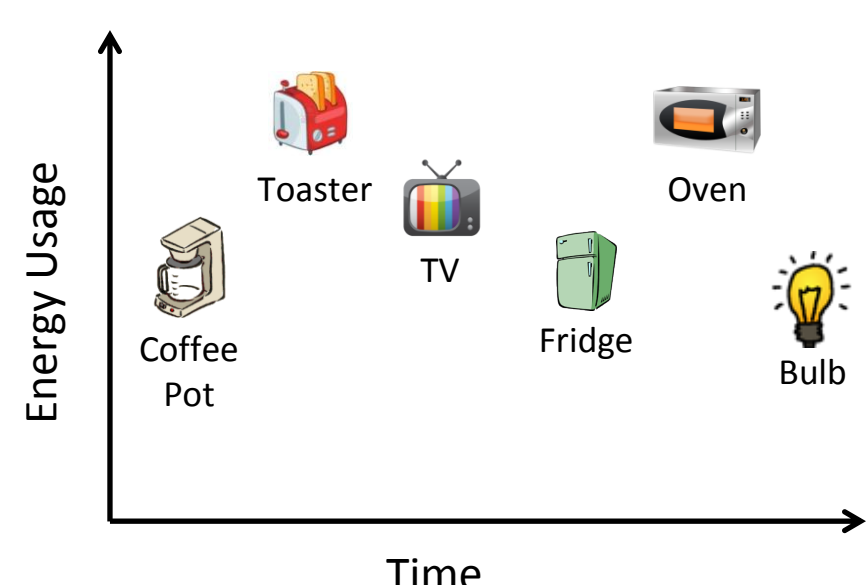
2 Importance of Consumption Data



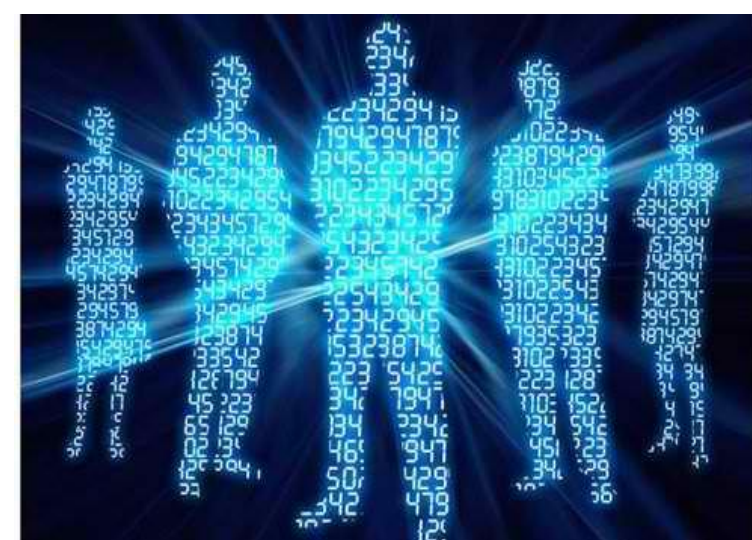
Personal Data
Subject to EU Directive 95/46/EC

3 Privacy and Security Issues

3.1 Privacy



Consumption Data
Compromises Privacy
of
Individuals



3.2 Confidentiality



Stored Data

Exchanged Data



3.3 Trust

- Fully-trusted environment
- Semi-trusted environment
- Untrusted environment



3.4 Data Usage and Consent

Aggregations



Consent for Specific Purpose

3.5 Access Control

Coarse-grained
versus
Fine-grained



3.6 Integrity and Non-Repudiation

Tamper Resistant
and
Unforgeability



3.7 Availability

Ensuring Availability
and
Preventing Denial-of-Service (DoS)



3.8 Transparent Auditing and Verifiability

Consumers verify what they are charged for

Energy Suppliers ensure that consumers pay according to energy use



4 Conclusion

This is call for action to design an integrated framework that can address privacy and security issues in smart grid systems in a holistic fashion



5 Reference

Muhammad Rizwan Asghar and Daniele Miorandi. **A Holistic View of Security and Privacy Issues in Smart Grids**. In Jorge Cuellar, editor, Smart Grid Security, volume 7823 of Lecture Notes in Computer Science, pages 58–71. Springer Berlin Heidelberg, 2013.