WISHI

How to integrate IoT with Energy

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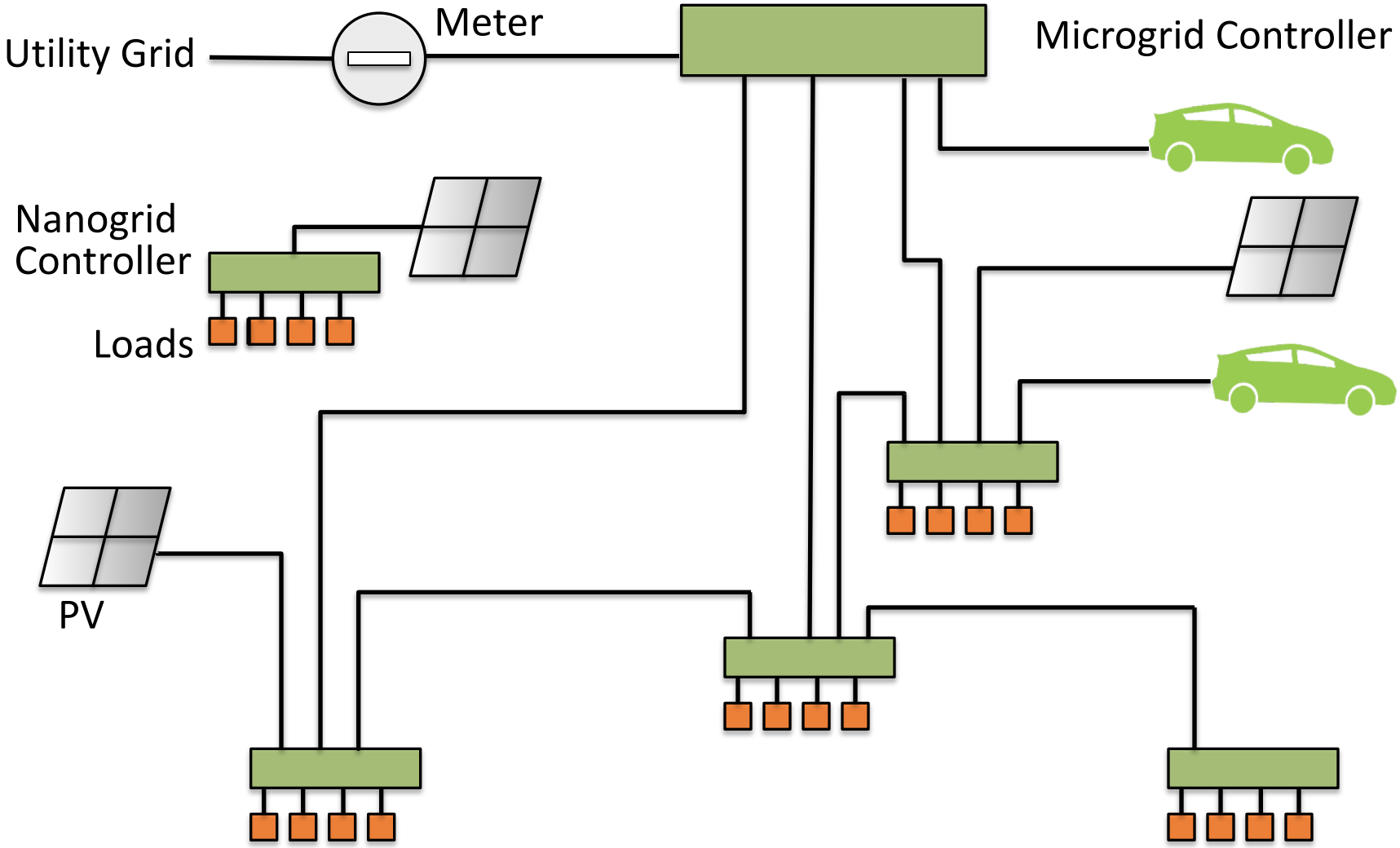
Early 2000s

- *Electronics on way to all being networked*
- *In long run, everything to be networked*
- *IT historically abstracted from physical world*

- What new architectural innovations/principles do we need as networking extends to physical-world devices?
- … with physicality in part that they consume energy?

Networked Electricity

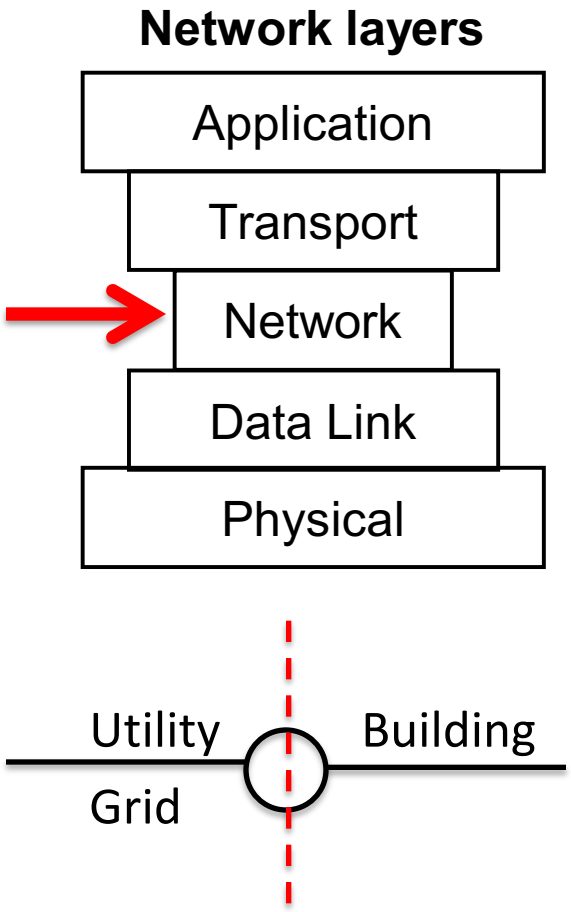
(Local Power Distribution)



All connections peer-to-peer and can be changed dynamically

Price is how devices know which way power should flow

Buildings need three Layered Models

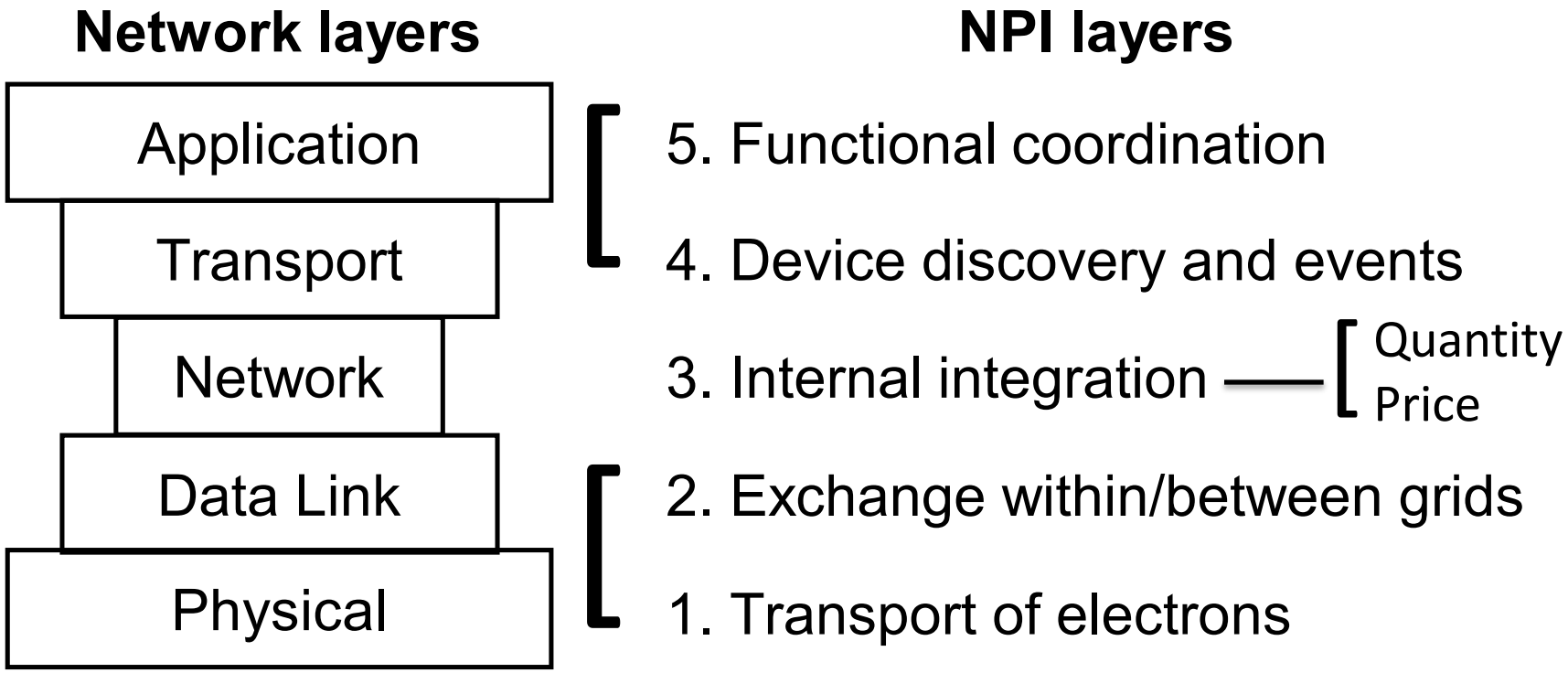


*Narrow waist in layering **isolates complexity** – facilitates interoperability*

- Conventional network communication
  - Application and physical layers
- Electricity / utility meter
  - Separate utility grid from building
  - "Highly dynamic pricing"
  - Use only Price, Quantity
  - Only 1-way communication
- Device internal Network Power Integration

Layered model for device operation for Local Power Distribution

Network Power Integration



Thank you