From smart meters to smart grid: creating a connected energy network

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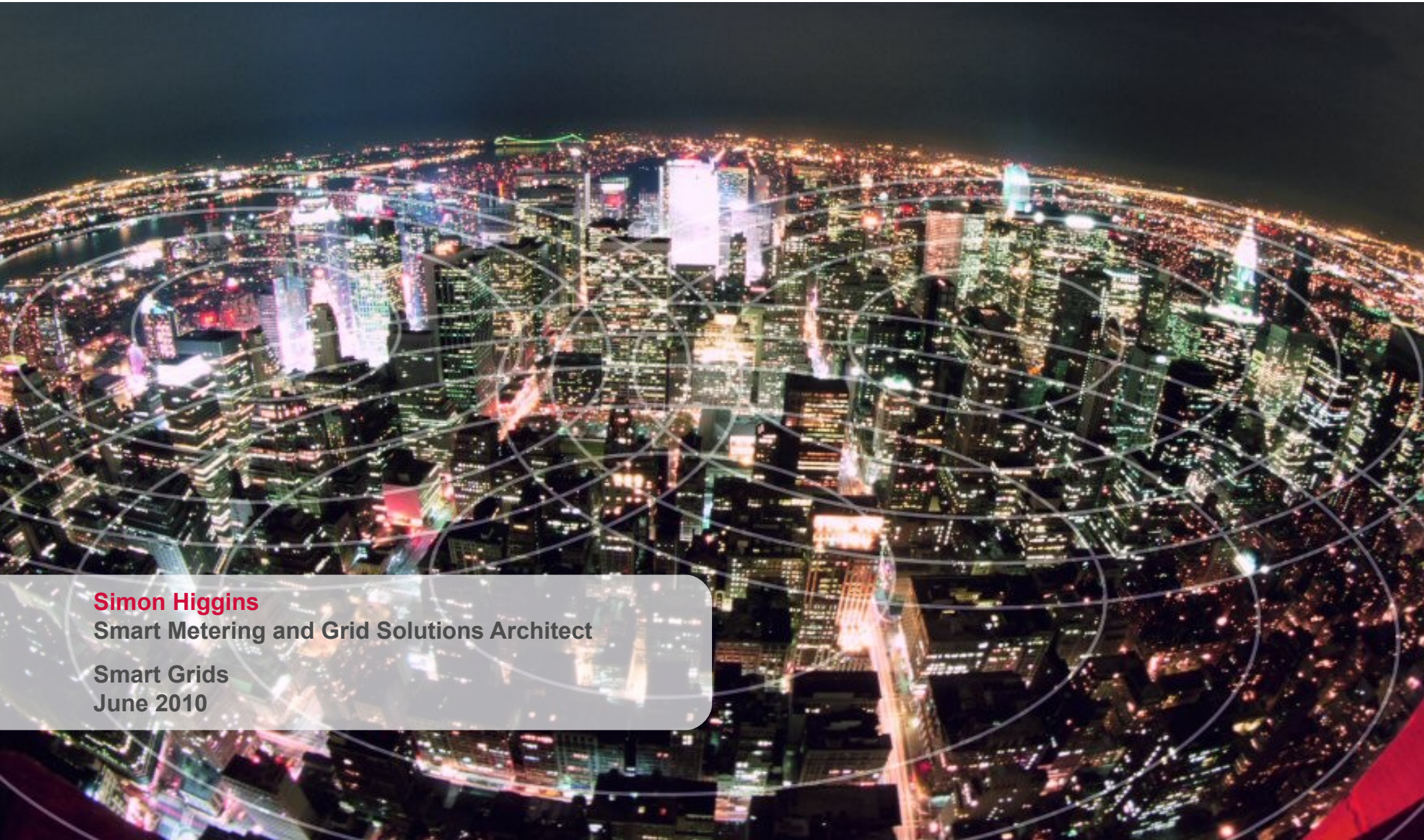

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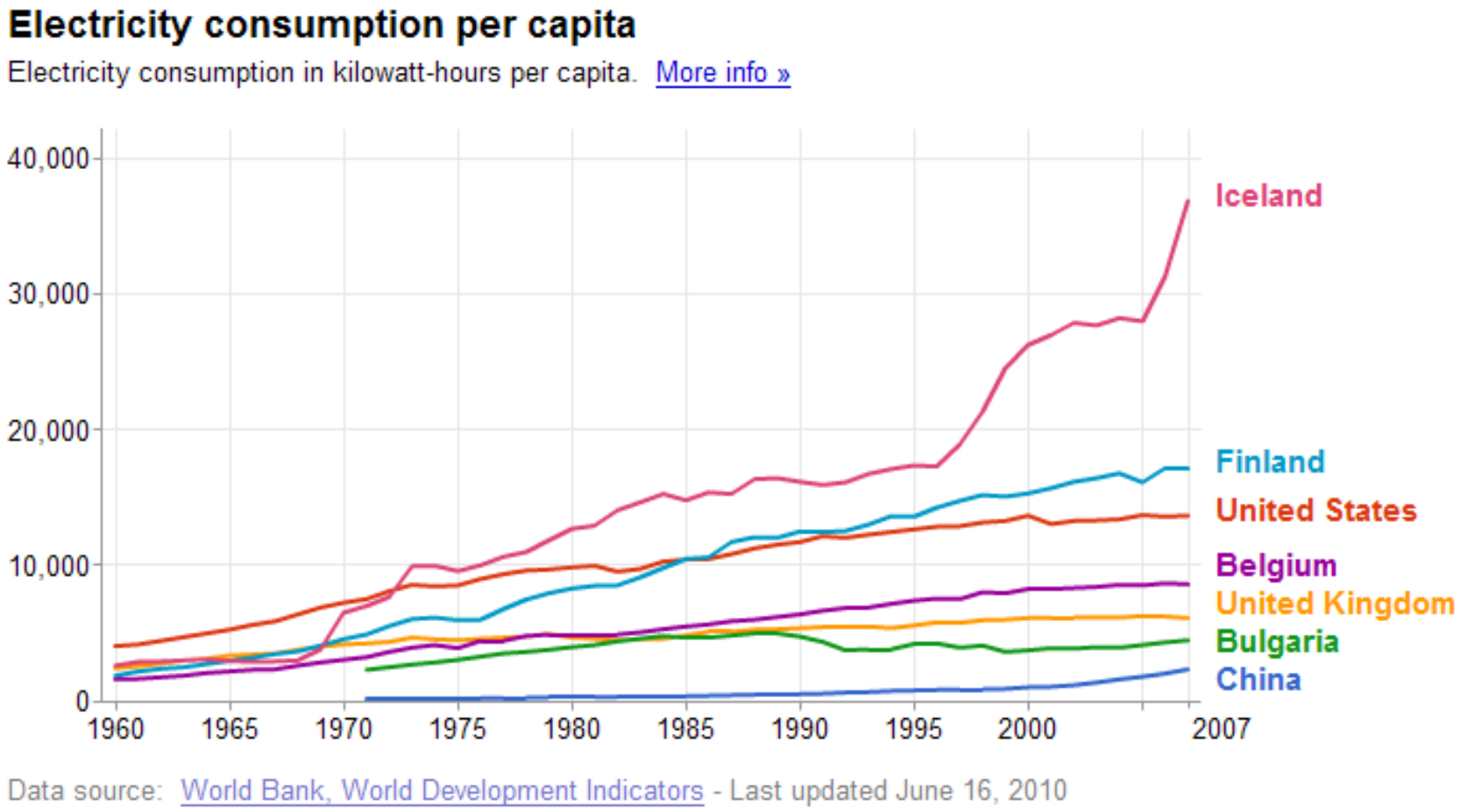
Smart Metering and Grid Solutions Architect

Smart Grids
June 2010

Smart Grid Infrastructure

- Drivers for Smart Meter and Smart Grid solutions
- Considerations when combining capabilities into a single communications solution
- Requirements for a combined yet independent solution

Electricity Consumption



Where smart meters and grid cross over

- Introduction of Electric vehicles, Ground source heat pumps and micro-generation
- DNOs will have an increasing need to use DSM products to balance their networks (and manage constraints).
- The meter will support multi-rate (TOD / CPP / Dynamic Pricing) tariff structures and a configurable combination of register types.
- At a national level this could involve addressing millions of meters within a 5 minute interval to effect load on their networks
- (ENA functional requirements for smart meters)

Smart Meter to Smart Grid

- Smart meters are the stepping stone
- A single smart grid
- Dedicated spectrum
- Dedicated channels

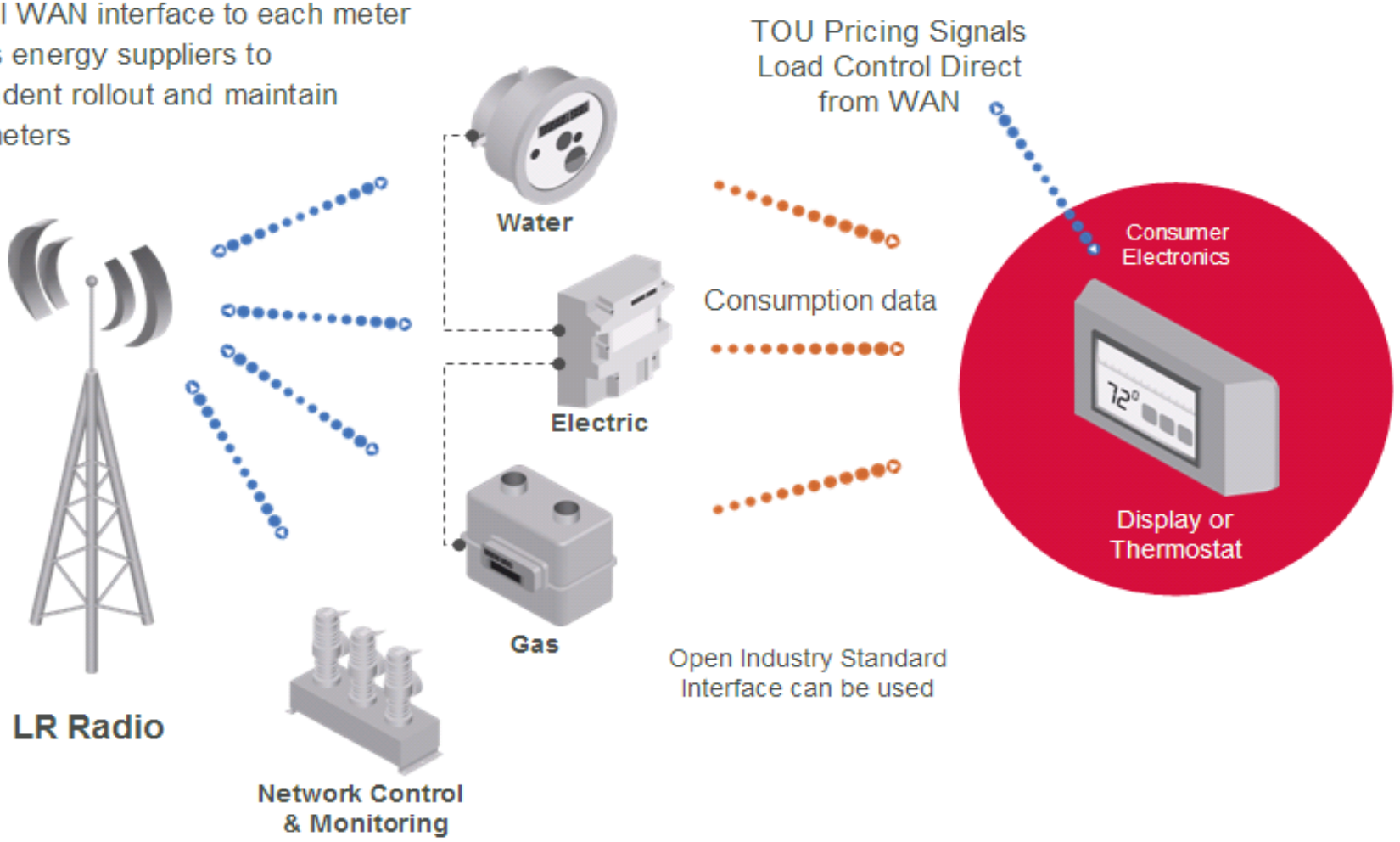
> *"Smart meters should be seen as the key to smart grids which will be vital if we are to manage demand effectively"*
>
> *27 May 2010*

Real Risks and Benefits

- Risks
  - No control over consumer!
  - Universal Service performance – ability to balance network
  - LV network from £ 0.75bn - £20bn
- Benefits of Advanced Smart Metering for Demand Response based Control of Distribution Networks (ENA & Imperial College)
  - Smart metering including DR result benefit of £0.48bn - £10bn
- Universal Service
  - Universal performance
  - Ability to address millions of meters within 5mins
  - Broadcast, Multicast

Delivering a universal communications solution

- Optional WAN interface to each meter
- Enables energy suppliers to independent rollout and maintain smart meters



Basic requirements of a communications solution to support Smart

- Dedicated
  - No vested interest in the consumer, not shared with consumer based products
  - Custom designed and optimised for smart metering and smart grid
  - Single point of contact ensures accountability for consumers
- Secure
  - Services operating critical national infrastructure
  - CPNI Guidelines for communications networks supporting critical national infrastructure
- Resilient
  - Ability to adapt and change to the environment.
  - Path diversity
- Universal
  - Single solution for 100% of homes
  - Major cost in impact assessment is the cost of visits to homes
  - Common platform for Smart Energy, Smart Water and Smart Grid
- Fair, Reasonable and Non-Discriminatory access
  - Maintaining retail competition, allowing access for all energy market participants
  - Promoting choice and value for consumers

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