






CCS – Risk Issues and Risk Management

CSLF Financing Roundtable

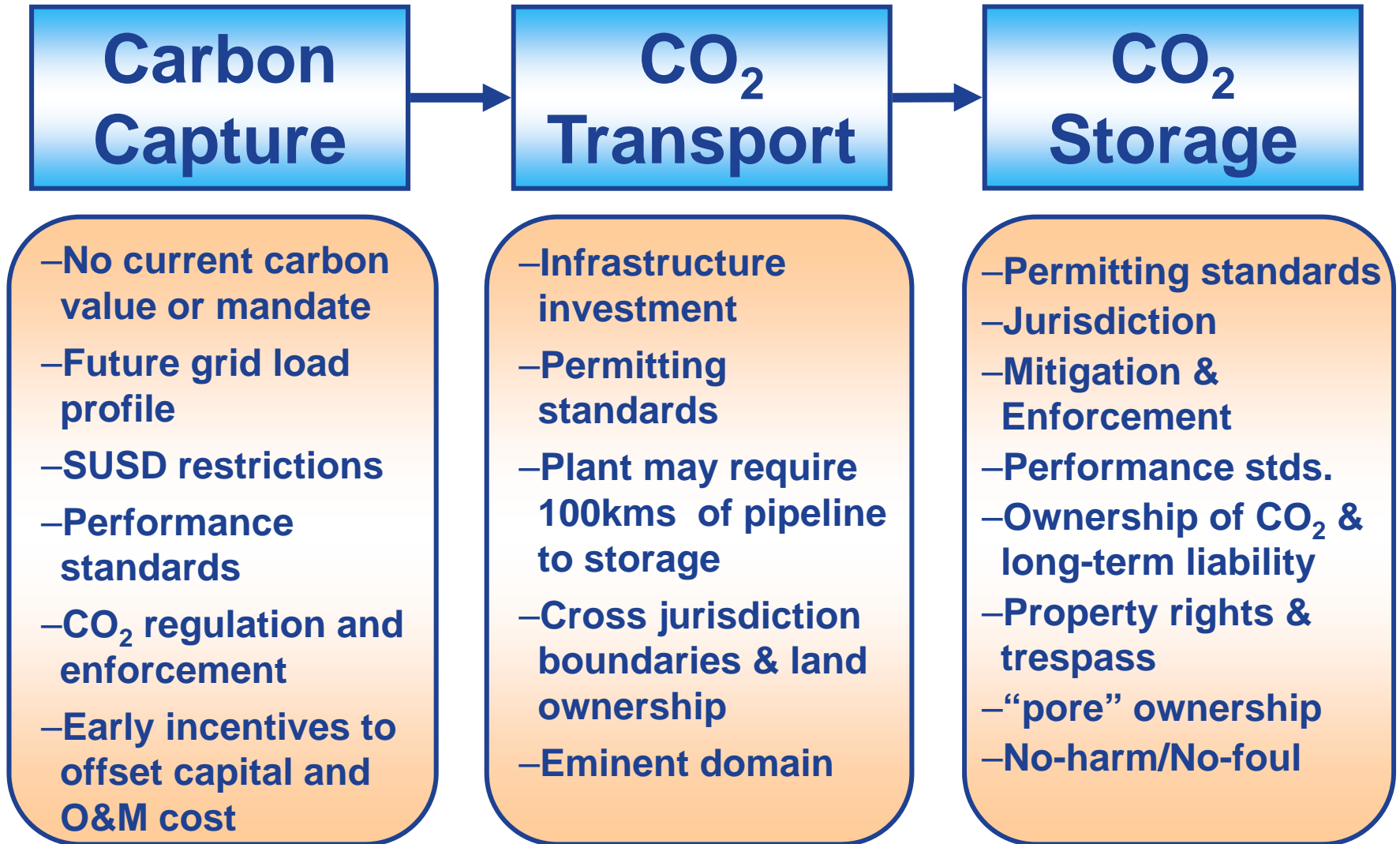
Norman Shilling
Senior Product Manager, Policy
GE Energy



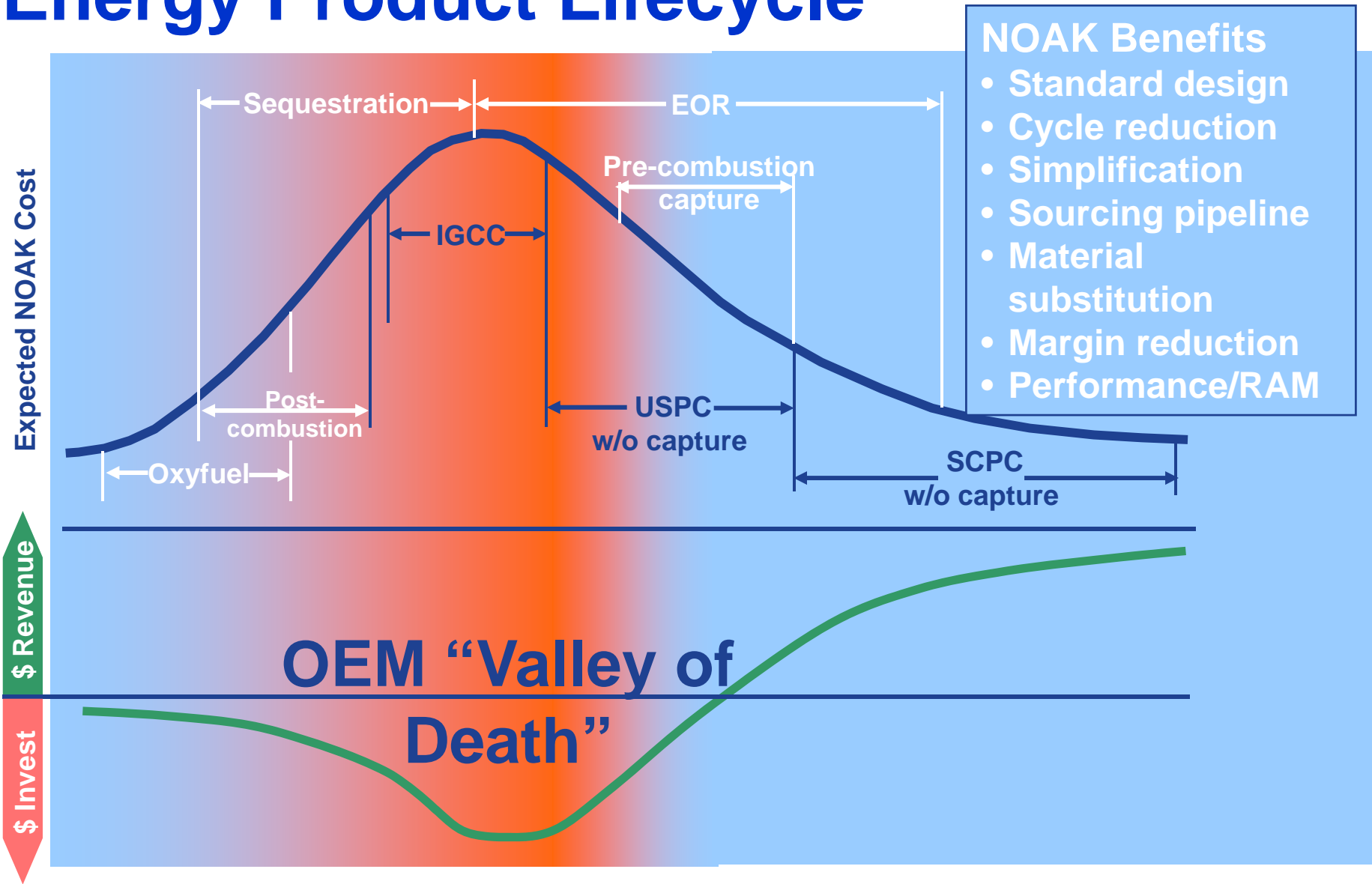
Reality: Big challenges to CCS

Issue	Challenge
 <p>Changing the Face of Coal</p>	<p>The lack of a consensus coal roadmap Commitment to achieve the change No policy or regulatory certainty that establishes a value for CO₂ and CCS</p>
 <p>Legal Risk</p>	<p>Tort, pore ownership and long-term liability (e.g. RCRA/CERCLA/NERD) for CO₂ will prevent utilities from transporting or storing CO₂</p>
 <p>Technology</p>	<p><u>Existing plants</u>: development and full-scale demonstration of retrofit technologies <u>New plants</u>: Deployment of proven and commercially-offered capture technology and integration with T&S</p>
 <p>Public Acceptance</p>	<p>NUMBY -- Public resistance to CCS projects in their communities.</p>
 <p>Finance</p>	<p>Government funding inadequate to prove that CCS is commercially viable and poses acceptable risks PUC mandate for lowest cost CO₂ transport infrastructure</p>

The CCS chain



Energy Product Lifecycle



Integrating capture and sequestration

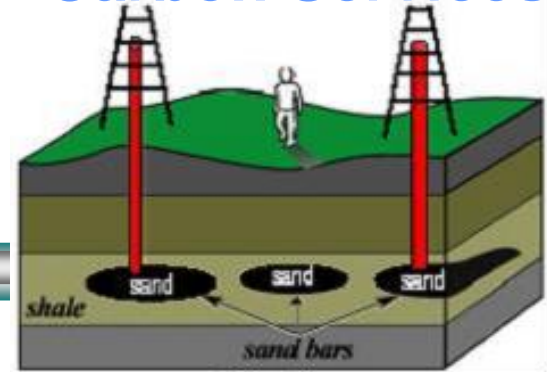
GE Energy

Pipeline
Developer

Schlumberger
Carbon Services



Interface
Definition



Cost Efficiencies

- CO₂ quality
- Preservation of injectivity & capacity
- Regulatory
- Materials, components & features

Operability & Reliability

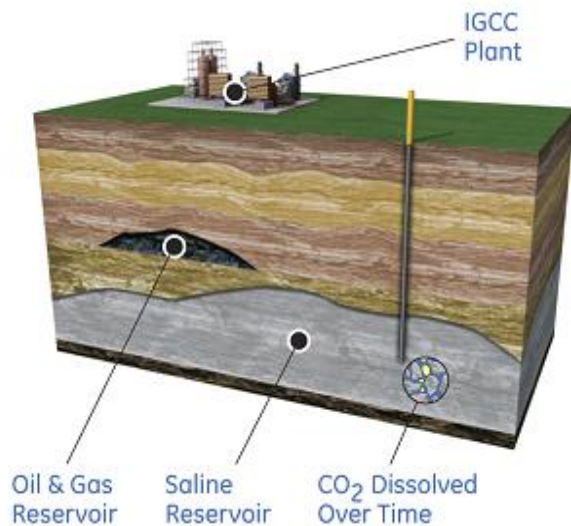
- Integrated, consistent mission profiles
- Design for planned & unplanned outages
- Response to upsets
- Safety

Project Execution

- Coordinated schedules for plant and storage facility
- Permitting
- Commissioning of plant & sequestration facility

Deployment of CCS unlikely until...

- CO₂ emission rules are established
- CCS is demonstrated in several projects with
 - >1 million tonnes of CO₂ per year
 - In multiple geologies
 - Fully integrated power and CCS
- There is public acceptance of CO₂ sequestration in multiple geologies and countries
- The issue of long-term liability for stored CO₂ is resolved
- A stable price (and trajectory) is established for CO₂ emissions



What is the future for CCS?

The industry has...

Proven technology

Potential projects

What is needed to move CCS forward...

Government incentives & indemnity for pioneers

Commercial scale projects to drive the experience curve to the next level and justify investment in technology improvement by industry

We need to show the doubters the **solutions** to energy security, GHG.

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Q&A

