

Infrastructure and Energy

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Multi-Metric Climate Change Impacts Valuation

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Valuation: Infrastructure and Energy (I):

- Because energy and shelter, mobility, health protection and other infrastructure services are *basic human needs*, valuation occurs in a constrained marketplace: shaped by public policies, citizen expectations, and public images
- Conventionally, valuation is determined by an equilibration of provider (supply) and consumer (demand) perspectives – metrics are complex:
 - Provider perspective: business planning, often at at very large scale, e.g.:
 - Market size and market share
 - Cost of construction and cost of replacement
 - Net return on investment/profitability
 - Risk management
 - Consumer perspective: hassle-free entitlement, often at a very small scale, e.g.:
 - Energy: adequacy, reliability, affordability, acceptability
 - Infrastructure: the same, plus convenience and status

Valuation: Infrastructure and Energy (II):

- **More fundamental issues in valuation:**
 - **Valuing *services* as well as facilities and commodities: what people consume for**
 - **Measuring services provided – a key to efficiency improvement**
 - **Assessing motivations behind consumer preferences – a key to providing what people want, not just what they consume**
 - **Valuing non-monetary benefits and costs: e.g., health, happiness, opportunity**
 - **Valuing benefits and costs in *the long term*: when so many energy and infrastructure investments are large and benefits are realized over periods of many decades**
 - **Discount rates – dominate long-term valuations of economic costs and benefits**
 - **Risks: changes in the global financial environment, changes in the domestic policy environment, changes in science and technology, changes in the “natural” environment – e.g., longer-term threats to realizing full value from near-term investments**
 - **Sustainability – what decisions and actions *now* fit where the world *needs to be* in half a century or more? (a good fit is a less risky investment than what may be a poor fit)**

Valuation: Infrastructure and Energy (III):

- **Valuing climate change impacts and risk management strategies for *infrastructure and energy* is dominated by big-picture issues:**
 - **Energy/infrastructure climate change impacts and responses dominated by large-scale events and large-scale decisions that cast long shadows**
 - **Dominated by major players with impressive financial and managerial resources; relatively well-adapted to climate variability; and in many cases already factoring climate change-related risks into their strategic thinking (example...)**
 - **In many cases, sectors already under some stress: energy sector dealing with decarbonization, infrastructure sectors often dealing with aging current infrastructures**
 - **At the margin, not extremely sensitive to climate parameters unless other stresses threaten tipping points:**
 - **Main concerns are about making long-term investment decisions under so many uncertainties – where policy uncertainties are probably greater than climate change uncertainties**
 - **Main threats to risk management are extreme events and severe climate change, especially if climate change is severe enough to require transformational adaptive responses**
 - **Concerns are often focused at a regional scale rather than a national scale: particular attention to especially vulnerable areas**
 - **Sectors that are a focus of efforts to address mitigation and adaptation in an integrated way – integration of M&A benefits and costs is seldom attempted but of growing interest**