Evaluating energy R&D

Timing and mechanisms of evaluation

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Defining evaluation

• **Evaluation** is systematic determination of merit, worth, and significance of something or someone using criteria against a set of standards

• **Evaluation** is the systematic acquisition and assessment of information to provide useful feedback about some object
  
  • data collection
  
  • judgement about the validity of data and of the inferences we make about it
  
  • useful feedback to various audiences
Motivation

• **Acceleration**
  • Technology development needed to address the three Es, more than ever!

• **Accountability**
  • Who can call for an account and who owes a duty of an explanation:
    • Political
    • Administrative
    • Professional
Some lessons learned from science - Tetlock

How to cope with accountability predicaments:

1. Pre-emptive Self-criticism (pre-exposure)
   • motivates people to become more open-minded and flexible
   • but may also lead to undue attention to worst case scenarios, setting weak standards, confusion, vacillation and weakness

2. The Acceptability Heuristic
   • motivates people to build a sort of consensus and unanimity and checks a range of judgemental fallacies otherwise not considered
   • but may also lead to group thinking and opportunistic behaviour

3. The Rationalisation Heuristic
   • motivates people to keep the course of action once taken, rationalising past conduct through defensive bostering
   • but may also blinds people not to acknowledge the facts
Looking forward to learn from governments and experts with hands on experiences
Wrap up

- **Ex-ante (Swedish case; IEA acceleration project)**
  - Transformation of the energy system and the strategic role of ERD&D in bringing down Cost of Energy for new technologies
  - Trade off between
    - Risk taking vs demonstrating success in RD&D, especially having the uncertainty in RD&D in mind
    - Intended and unintended behavioural consequences (Ph.D’s, innovations etc.)
    - National focus vs. opportunities for international cooperation
    - RD&D (push) vs. other market support mechanisms (pull), also in terms of expenditure.
  - Strategic holistic approach needed to transform energy systems
  - Diverse roles, perspectives and stakeholders when building consensus on new priorities and design programmes
  - Input and inspiration from other sectors (health, agriculture etc.)
  - RD&D is long term, relevant for energy systems and global markets; it may have huge impact, but it takes time and requires patience.
Wrap up

- In progress: keeping pace in the race (EU and US cases)
- Development and implementation of monitoring systems and tools
  - Step-wise roll-out (pilot, learning or cautious process?)
  - Tailor made data and tools - transparency
- Methodological challenges when measuring impact of public strategic plans on overall policy goals, impact on policies, R&D investments, action progress/performance
- Requirements for both qualitative and quantitative data and analysis
- Standardising performance measurements, data collection and use of performance information (feedback)
- The powerful tool of scoreboards for decision-makers whereas practitioners more interested in using performance information
- Information sharing is about stable monitoring architecture
- Systematic linkages in the process from mission to performance
- Technology development and tracking that progress not restricted to one country (or company) – good case for international cooperation!
Wrap up

- **Ex-post: Back to the future (Nordic scoreboard, US case and international case)**
- The methodological challenges in developing cross-country indicators covering the value chain in its context
- Need for improvements on individual indicators as well as composed indicators, incl. better data on industrial activities, investments, tech transfer, policy framework conditions etc.
- Retrospective and prospective evaluations
  - R&D takes time and requires long term impact assessment
  - Defining and measuring benefits and costs (3 Es) analytically demanding
  - Adapting retrospective methodologies to prospective construct
  - Always uncertainties to take into consideration – complex technologies, dynamic markets, changing society
- Systemic evaluations and impact assessment frameworks
  - narrative, indicator, self evaluation and context sensitive approaches
Decalogue I - Kieslowski

- Systematic acquisition and assessment of information to provide useful feedback about some object
  - 3 As – acceleration, accountability and advocacy
  - Data collection - Validity and reliability
  - Analysis of data – equations, models, constructs
  - Use of data, feedback to practitioners (learning and adaptation) and [cautious] implications
  - Simple, accurate and consistent
- Need for improved methodologies, tools and information sharing on what works and what not (and some common sense)