CONCEPTUAL FRAMEWORK FOR EVALUATING MULTIPLE BENEFITS FROM ENERGY EFFICIENCY

INTRODUCTION

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Energy efficiency can help drive economic prosperity.

Cumulative investments in energy efficiency of $12 trillion are more than offset by fuel savings & trigger economic growth of a cumulative $18 trillion.

GDP in Efficient World Scenario versus New Policies Scenario, 2035

- Japan & Korea
- OECD Europe
- United States
- China
- India
Portfolio of actions to reduce energy sector emissions

- Nuclear 7%
- Renewables 30%
- End-use fuel switching 9%
- CCS 14%
- Power generation efficiency and fuel switching 2%
- End-use fuel and electricity efficiency 38%
Energy Efficiency provides the largest contribution to abatement.
A huge opportunity going unrealised

Energy efficiency potential used by sector in the WEO 2012 New Policies Scenario

Two-thirds of the profitable investments to improve energy efficiency remain untapped in the period to 2035
Impact of supply- and demand-side improvements on US oil import needs

Source: WEO 2012
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Energy efficiency is a means to enhance energy security, support economic and social development, and promote environmental goals.
Launched at IEPPEC 2014
Available for free!
Focus
- Macroeconomics
- Public budgets
- Health
- Industry
- Utilities

Evaluation Workshop

- **Focus**: Evaluating the Multiple Benefits of Energy Efficiency: A Technical Workshop with a focus on the Buildings Sector.

- **Sessions**: Health; macro economy; occupants and owners.

- **Participants**: Policy makers; evaluation specialists.

- **Follow up activity**: working groups formed
  - Steered by IEA and IEPPEC;
  - 1. Conceptual framework;
  - 2. Evidence;
  - 3. Communications;
  - Working towards papers for IEPPEC conference in June 2016
DRAFT
CONCEPTUAL FRAMEWORK
FOR EVALUATING
MULTIPLE IMPACTS OF
ENERGY EFFICIENCY

IEPPEC INSTITUTE WEBINAR
APRIL 19, 2016

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INTRODUCTION: WHY MULTIPLE IMPACTS?

- IEA and IEPPEC collaborated on a project to explore and address the evaluation process relating to multiple impacts/benefits after the release of "Capturing the Multiple Benefits of Energy Efficiency," in Berlin 2014.

- A Framework can provide guidance regarding the process of evaluating these multiple benefits/impacts within the scope of an energy efficiency programme or policy assessment.

- An Impacts approach looks at both costs and benefits – takes a neutral approach.

- Goal is to understand net societal value of energy investments, while considering the co-benefits external to energy system. While;

  “the cleanest kWh is the one that is not used”

What other benefits or costs to society are due to the avoidance of using energy in specific settings?
THERE ARE MANY POTENTIAL CO-BENEFITS

Source: IEA
OBJECTIVE

The objective of this DRAFT conceptual framework is to:

- help policy makers, program funders, and other stakeholders involved in evaluation of EE programs understand the rationale for taking a comprehensive multiple impacts approach to evaluating EE policies, programmes and measures & to promulgate this approach.

In general, evaluations of EE may need to:
- Estimate energy and capacity reductions (kWh, kW, therms, or Btu).
- Assess any changes in quality and reliability of service.
- Determine the costs of projects/programs.
- Determine end-user satisfaction and acceptance of the program.
- Translate program impacts into environmental changes.
- Assess the value of potential co-benefits.
Choosing the right methods for the program/policy to be evaluated:

» **Who** needs evaluation? Who will benefit from the information provided in results?
» **Why** do they need evaluation?
» **What** type of program is being evaluated?
» **When** will the evaluation results be of most use to the various stakeholders?
» **Where** is the evaluation? What regulatory requirements are in effect in this jurisdiction?

Given these questions, we then ask:

» **How** does an evaluator select the “right” methodology to assure these needs are met?
WHEN TO MEASURE?
PROGRAM/POLICY LIFECYCLE

1. Planning

2. Market studies & Resource Potential

3. Project ex-ante energy savings

4. Design

5. Implement

6. Evaluation Ex Post: (EMV)
KEY STEPS

1. Planning
   - Define objectives of EE market intervention
   - Define ‘internal’ and ‘external’ evaluation needs
     - what sectors will be touched by programme?
   - What stakeholders need to be at the table?

2. Market and potential studies
   - What studies are needed in order to plan a smart market intervention?
   - For EE/DR/RE resources, after determining a baseline, typically we have the following potentials:
     - Technical
     - Economic
     - Achievable
   - What are the equivalent potentials in other areas touched (education, air quality, health, etc.) that can be identified at this stage?

3. Forecast ex-ante savings (ex-ante evaluation)
   - For energy, kWh and therms (there may be a Technical Reference Manual)
   - What about metrics for other areas? (productivity, job creation, etc.)
   - What data are available to measure?
KEY STEPS: CONTINUED

4. Programme/Policy Design
   - Understand the supply chain for product or service
   - Define market intervention strategy
   - Programme theory and logic describe expected outputs & outcomes
     - How do these outcomes impact other areas (jobs, air quality, etc)?

5. Implementation
   - Integrate data collection for performance metrics into programme delivery
   - Keep program funders, policy makers, and stakeholders informed of progress toward goals

6. Ex-poste EM&V
   - Provides for accountability
   - Transforms initial estimates into metrics on actual performance
   - Measures the energy impacts attributable to the programme
   - Determine effectiveness of programme delivery methods
   - Measures the impacts on multiple areas
Externalities: what’s included?

- Non-market benefits to society, or benefits that extend beyond a utility’s customers.
- Primarily environmental improvements, such as better air/water quality, water savings, improved health, etc.
GETTING THE DATA FOR THE BENEFITS MAY NOT BE EASY: EXAMPLE: COLLABORATION THAT MEASURES CO-BENEFITS

Source: thisismoney.co.uk
PRIORITIZING EVALUATION EFFORTS:
What accuracy is required for decision makers & stakeholders?
There are trade-offs whether analyzing energy or co-impacts

- Scenario 1: ISO Bid. Requires Accurate, Timely, Expensive
- Scenario 2: New Program Determine if it works as intended? Less Rigor typically
RAMPING UP MULTIPLE IMPACTS APPROACHES TO EVALUATION: WHAT CAN YOU DO?

- Identify expected co-benefits and costs in the planning phase
- Involve the relevant stakeholders early and often
  - Develop the relationships with the policy makers, investors, and stakeholders of interest, keeping in mind their priorities are probably not energy efficiency
- Understand the decision nodes of policy makers & others -> including the metrics they typically use to assess success in their field
- Find cost effective ways to get the data required for their metrics

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- Join the conversation at IEPPEC in Amsterdam
  - Conference is June 7-9
  - There are 4 panels on Multiple Impacts/Benefits
    - One panel focused on Working Group efforts
  - Full agenda available at: http://www.ieppec.org
A BIG THANKS TO WORKING GROUP MEMBERS

• Anca Diana Barbu, European Environment = co-chair
• Denise Mulholland, EPA
• A strong cast of contributors
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