International Energy Agency

Secure Sustainable Together

CONCEPTUAL FRAMEWORK FOR EVALUATING MULTIPLE BENEFITS FROM ENERGY EFFICIENCY INTRODUCTION

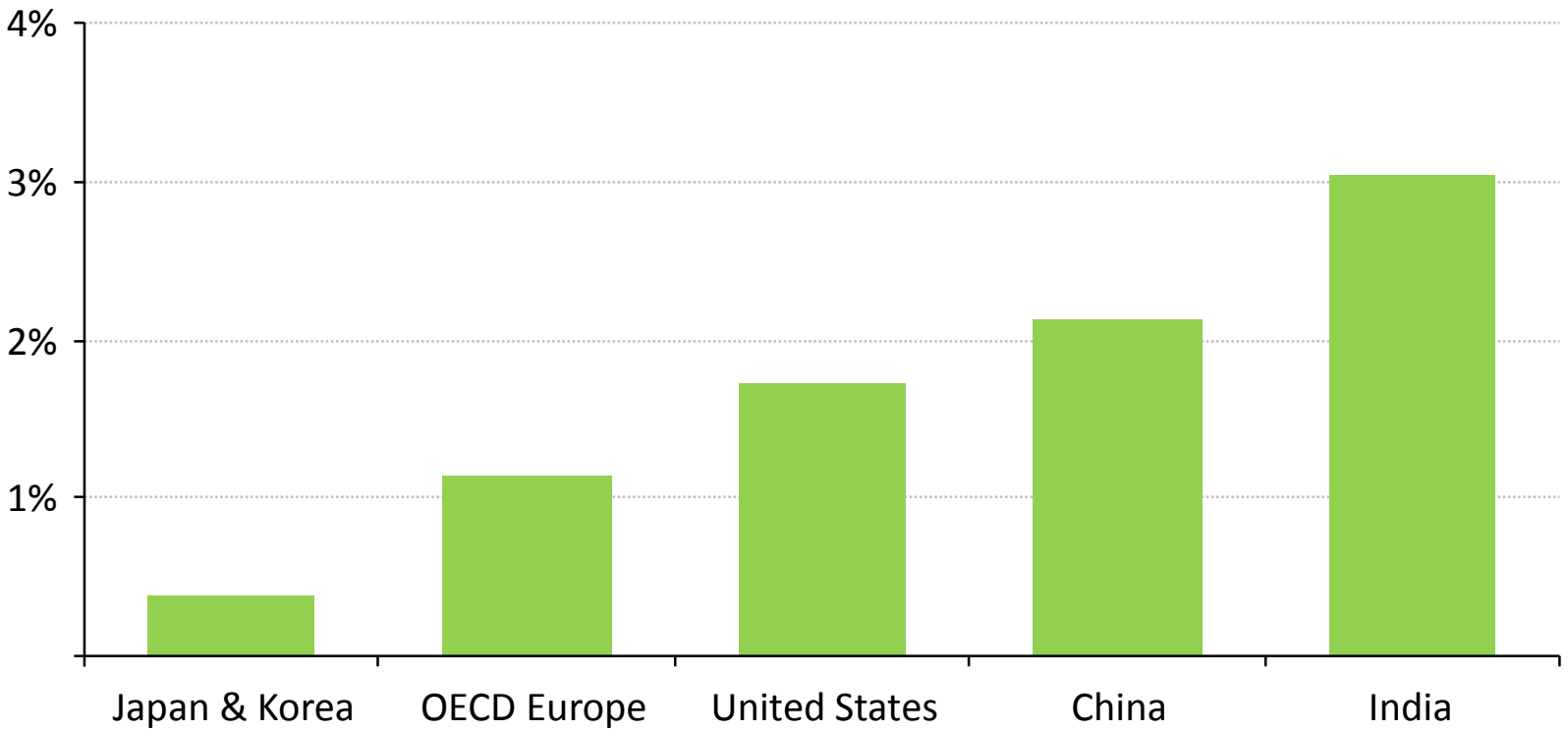
Samuel Thomas, Energy Efficiency Division, IEA

International Energy Agency
Secure Sustainable Together

Energy efficiency can help drive economic prosperity

www.iea.org

GDP in Efficient World Scenario versus New Policies Scenario, 2035

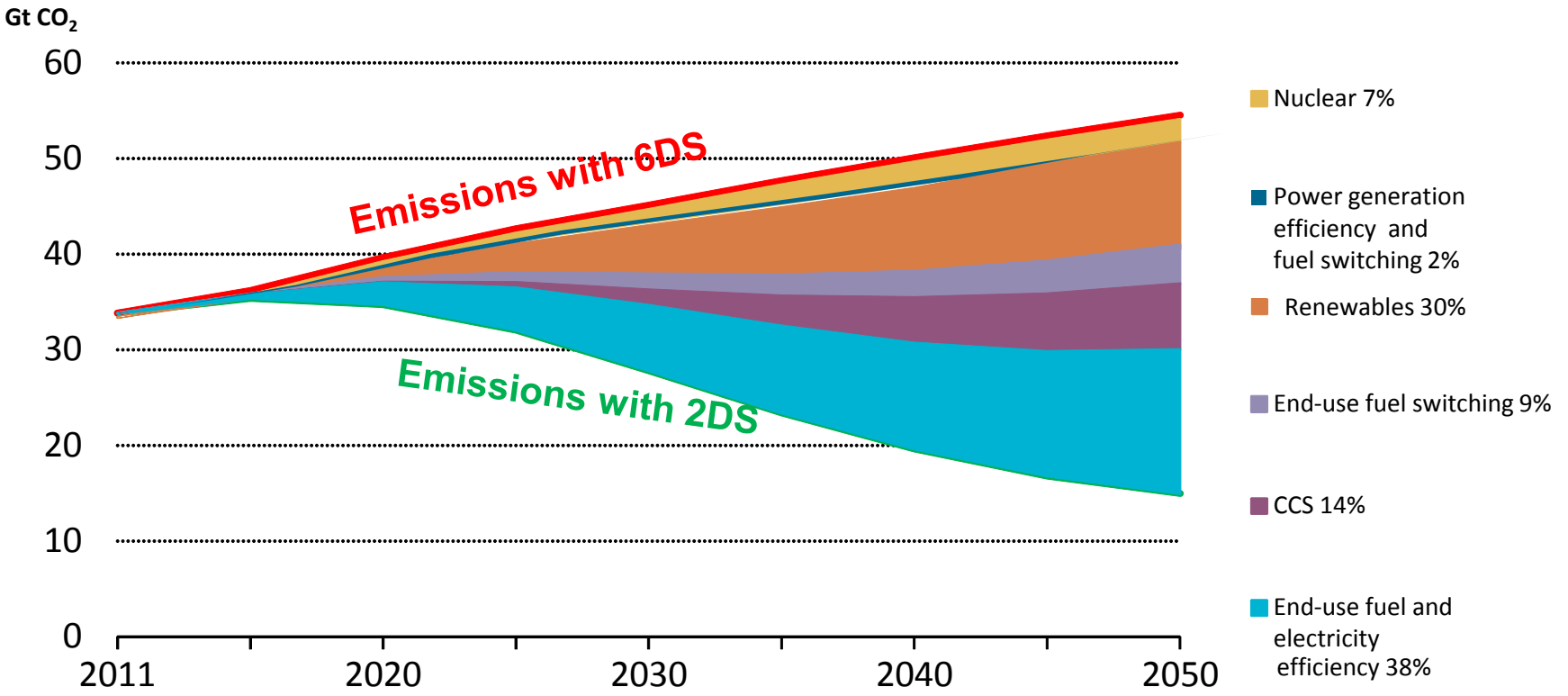


Cumulative investments in energy efficiency of $12 trillion are more than offset by fuel savings & trigger economic growth of a cumulative $18 trillion

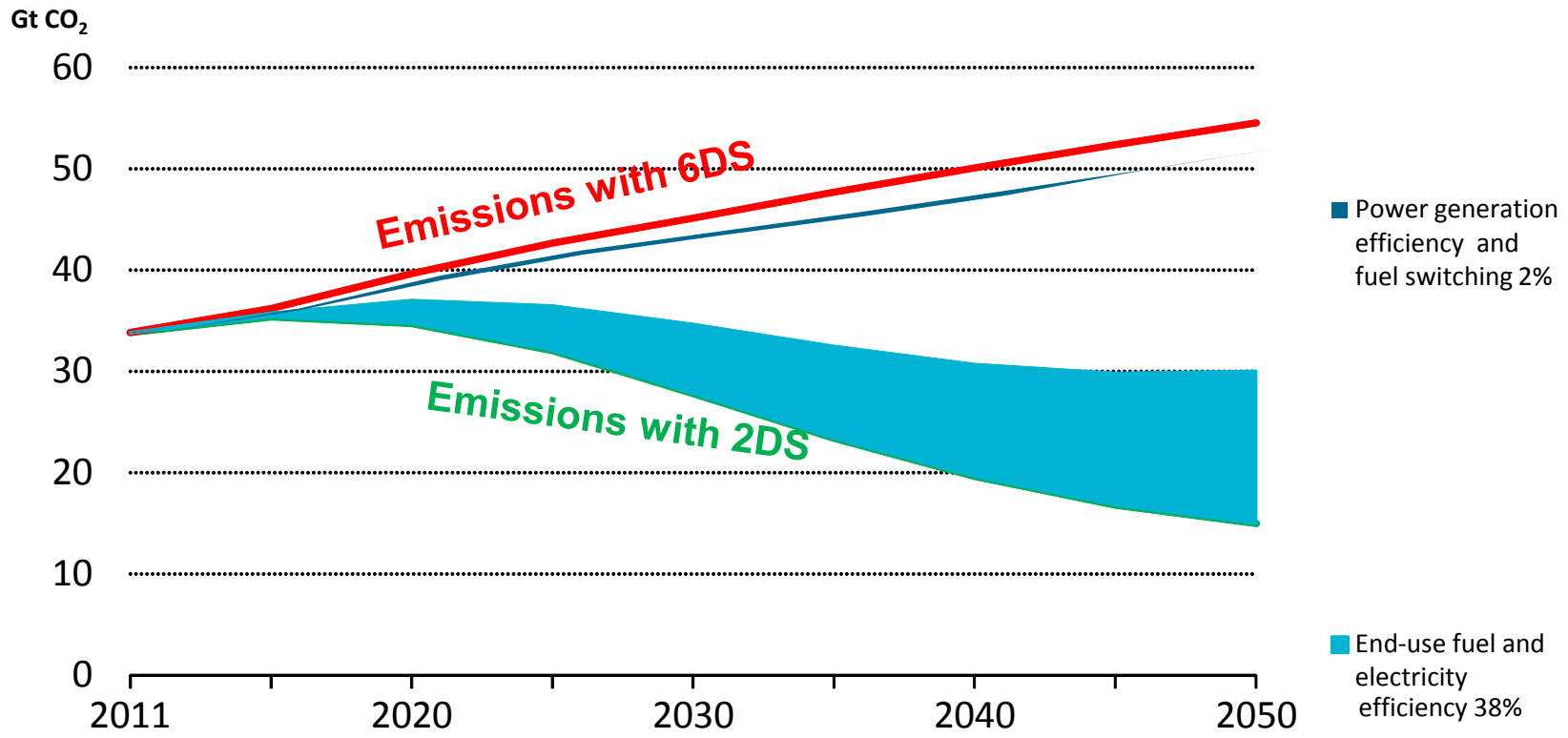
International Energy Agency
Secure Sustainable Together

Portfolio of actions to reduce energy sector emissions

www.iea.org



Portfolio of actions to reduce energy sector emissions

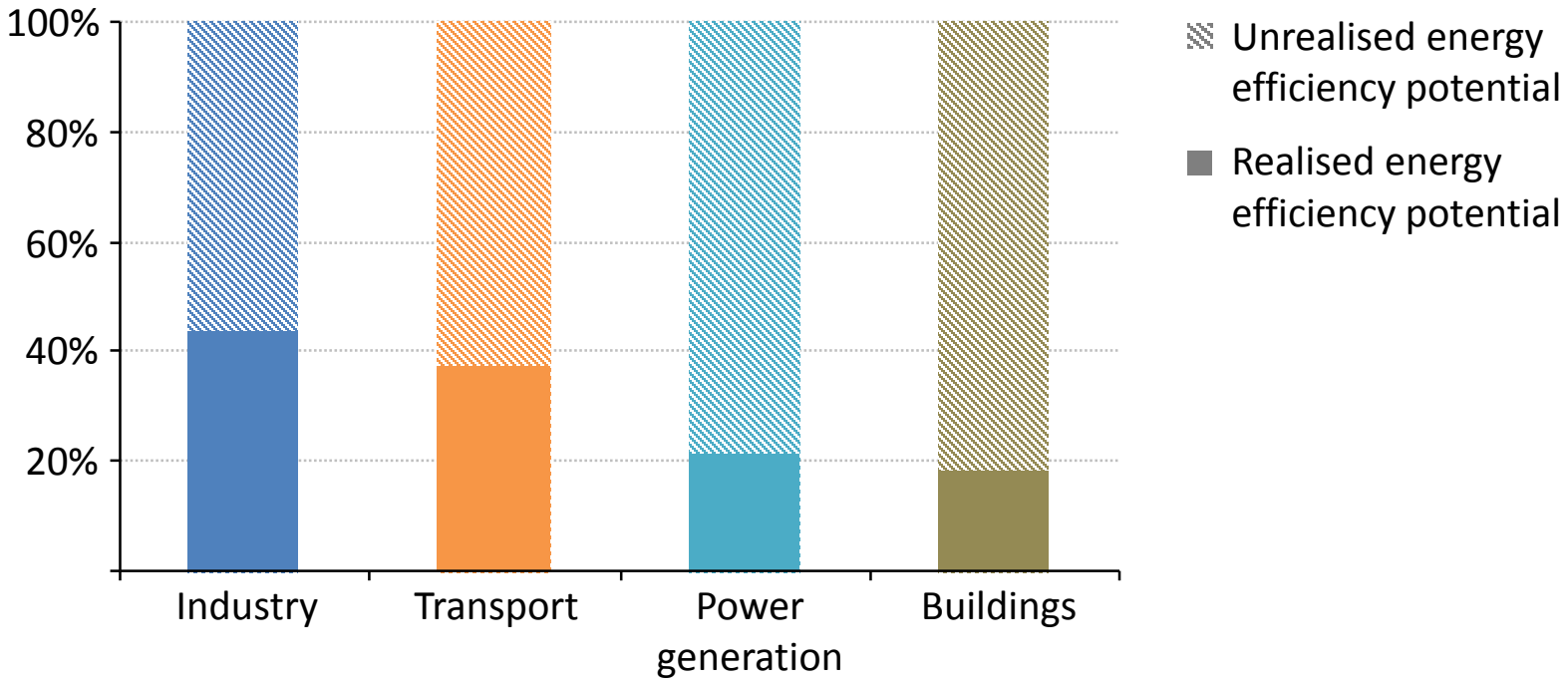


Energy Efficiency provides the largest contribution to abatement

International Energy Agency
Secure Sustainable Together

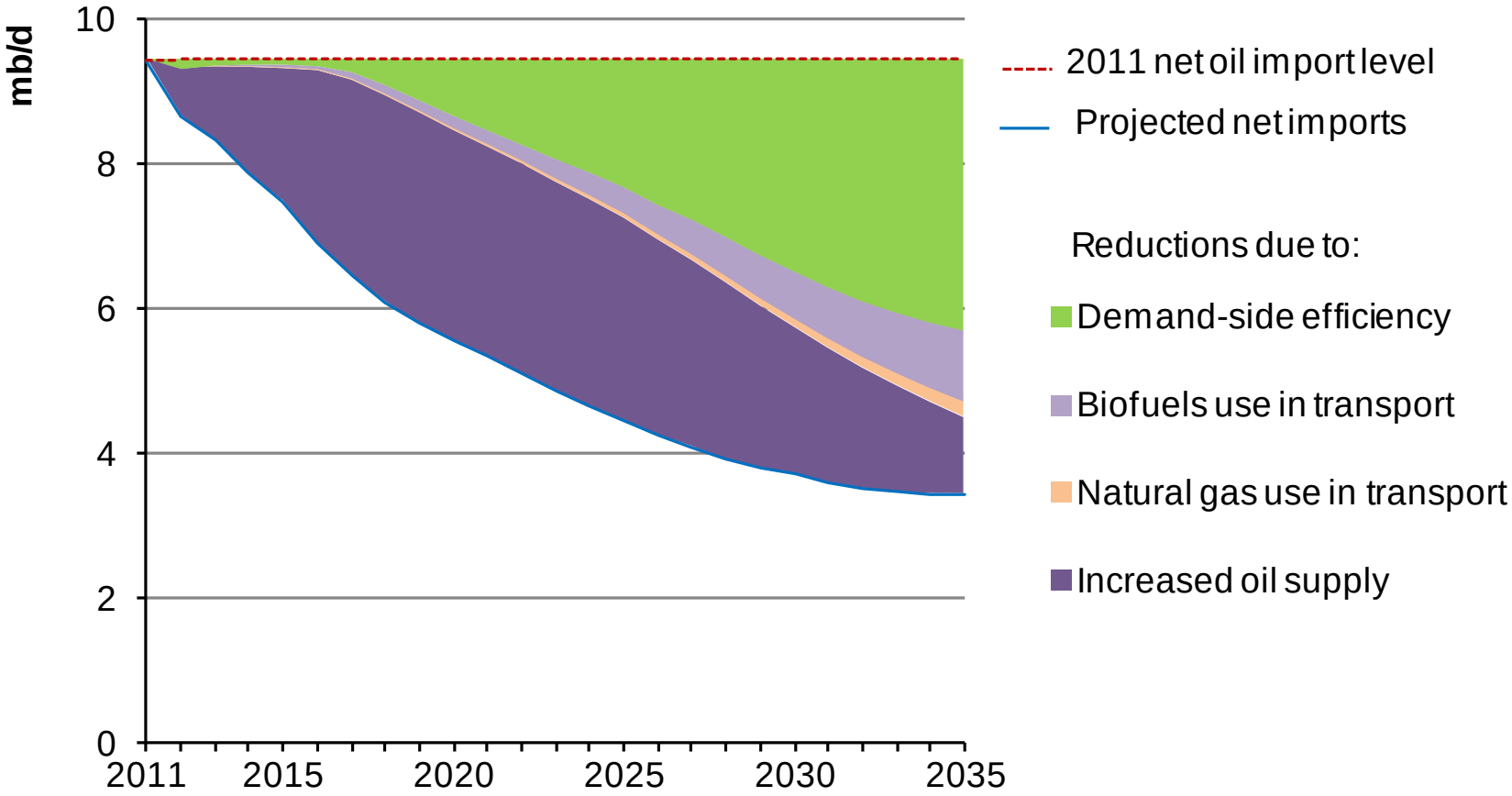
A huge opportunity going unrealised

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



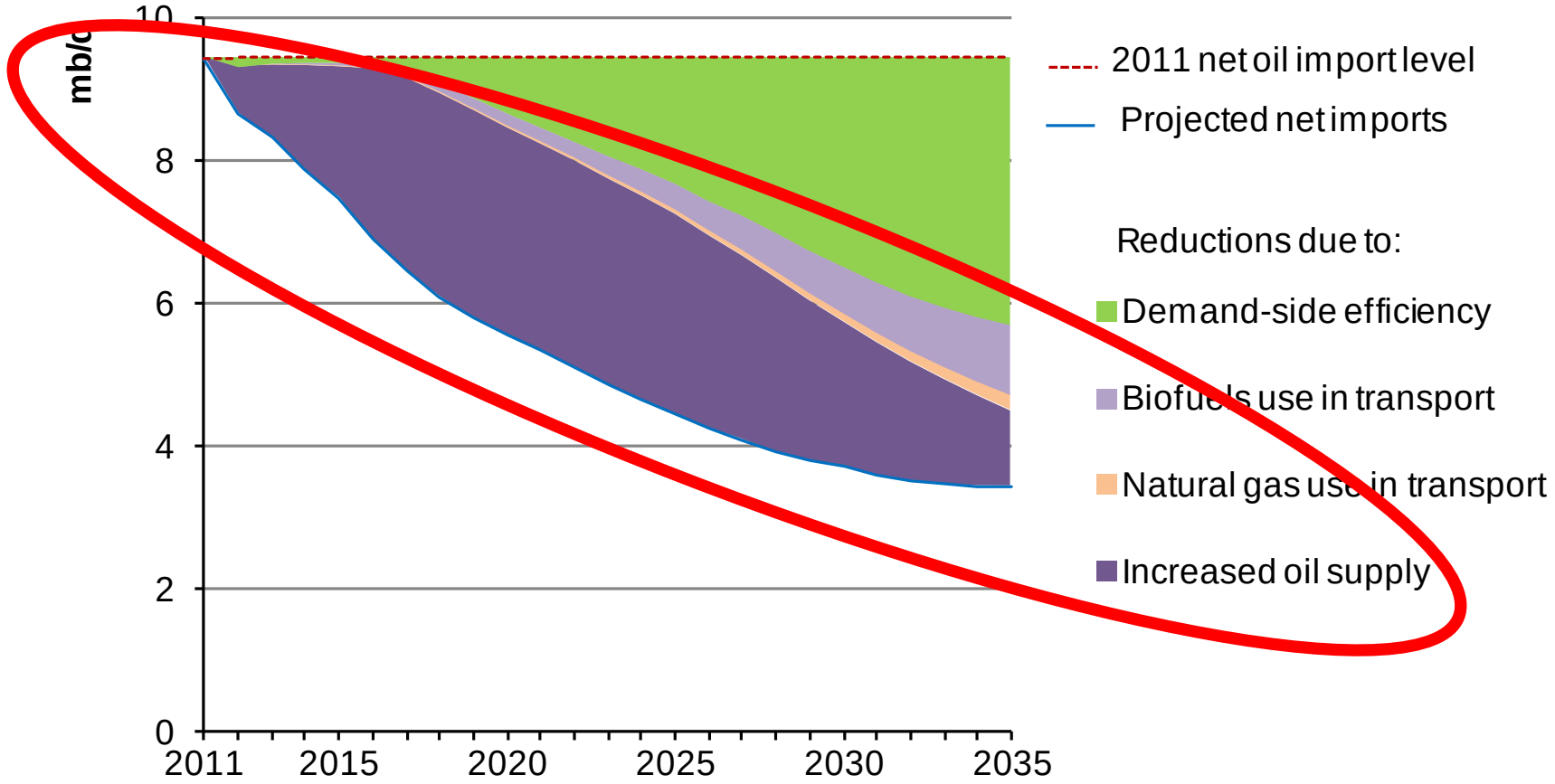
Two-thirds of the profitable investments to improve energy efficiency remain untapped in the period to 2035

Impact of supply- and demand-side improvements on US oil import needs



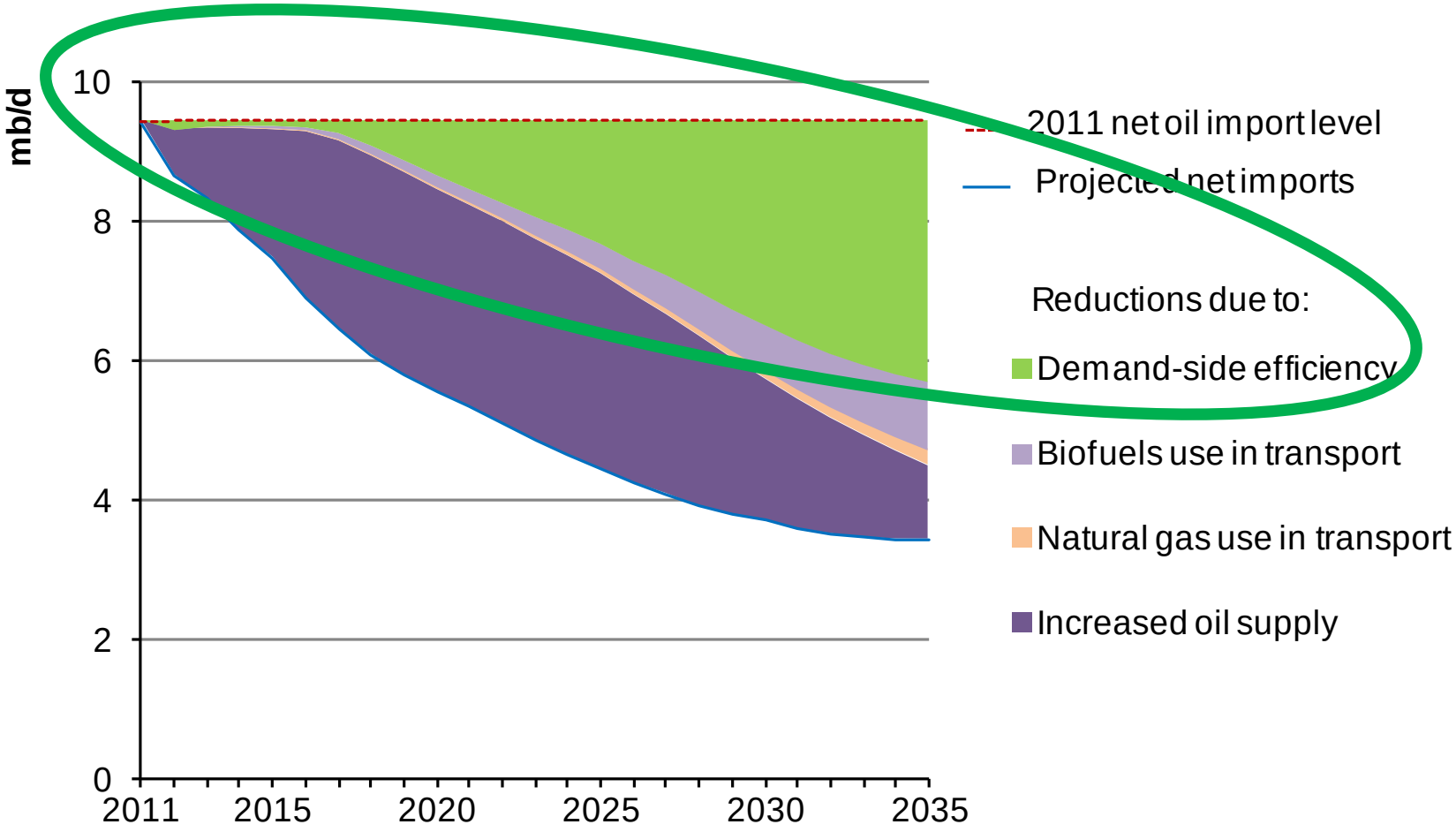
Source: WEO 2012

Impact of supply- and demand-side improvements on US oil import needs



Source: WEO 2012

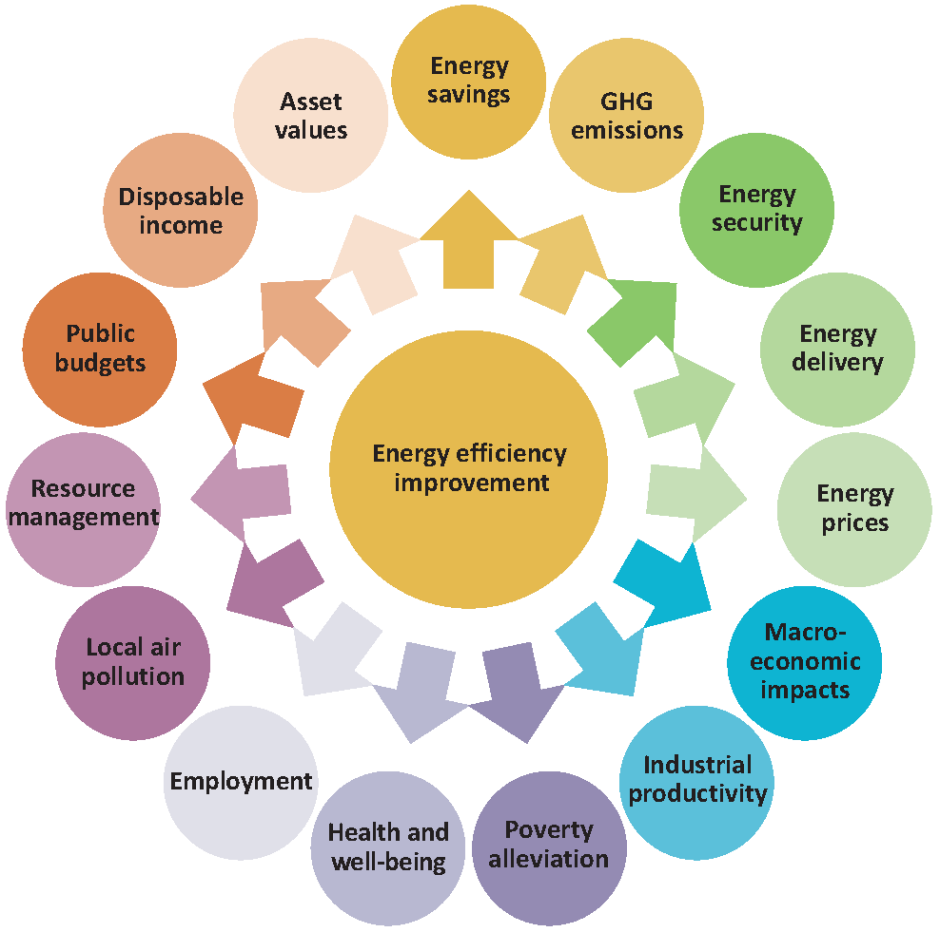
Impact of supply- and demand-side improvements on US oil import needs



Source: WEO 2012

International Energy Agency
Secure Sustainable Together

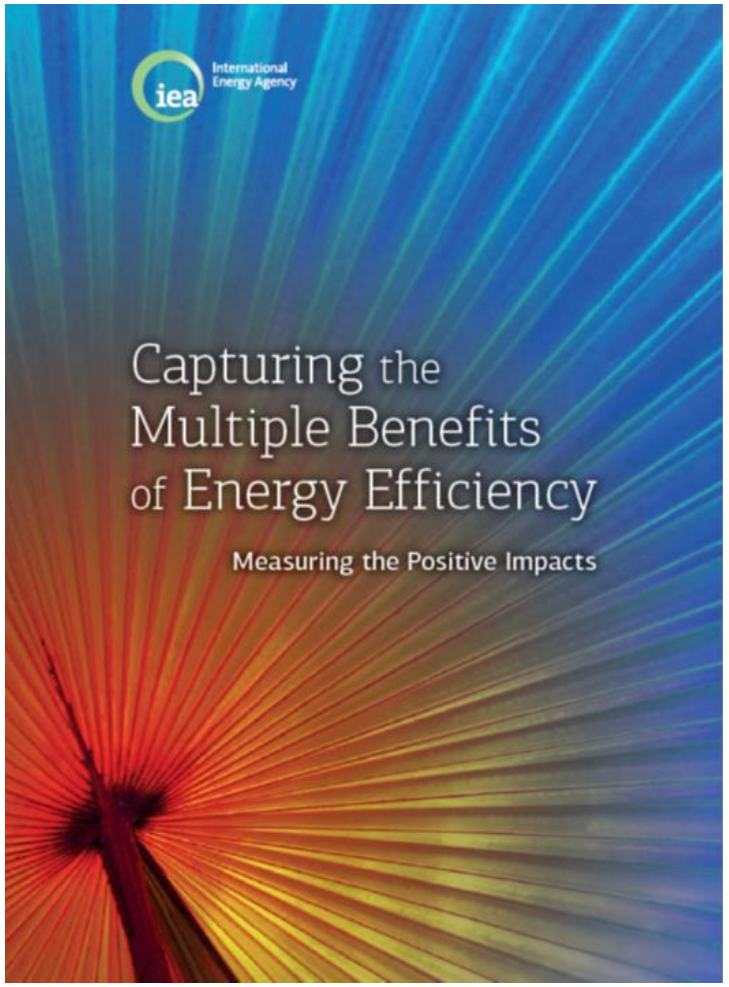
The multiple benefits of energy efficiency improvements



Energy efficiency is a means to enhance energy security, support economic and social development, and promote environmental goals

Publication

- **Launched at IEPPEC 2014**
- **Available for free!**
- **Focus**
  - Macroeconomics
  - Public budgets
  - Health
  - Industry
  - Utilities



http://www.iea.org/publications/freepublications/publication/capturing-the-multiple-benefits-of-energy-efficiency.html

March 11, 2014

Credit: Patrick Kovarik AFP

International Energy Agency
Secure Sustainable Together

Evaluation Workshop

www.iea.org

- **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

IEPPEC International Energy Policy & Programme Evaluation Conference

DRAFT

CONCEPTUAL FRAMEWORK FOR EVALUATING MULTIPLE IMPACTS OF ENERGY EFFICIENCY

IEPPEC INSTITUTE WEBINAR

APRIL 19, 2016

IEPEC International Energy Program Evaluation Conference

Kevin Cooney, Navigant

Anca-Diana Barbu, European Environment Agency

NAVIGANT

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)

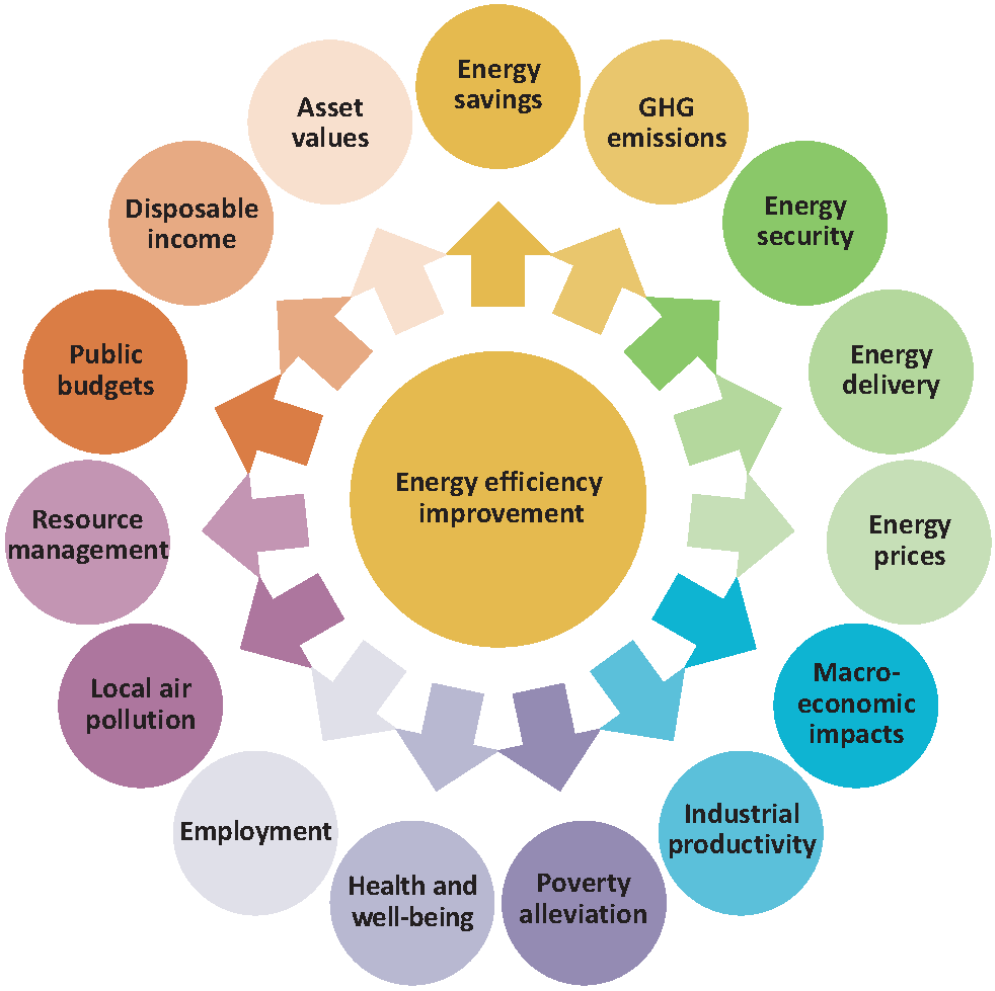
- A Framework can provide *guidance* regarding the process of evaluating these multiple benefits/impacts *within* the scope of an energy efficiency programme or policy assessment
- An Impacts approach looks at both *costs* and *benefits* – takes a neutral approach

- 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

NAVIGANT

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.

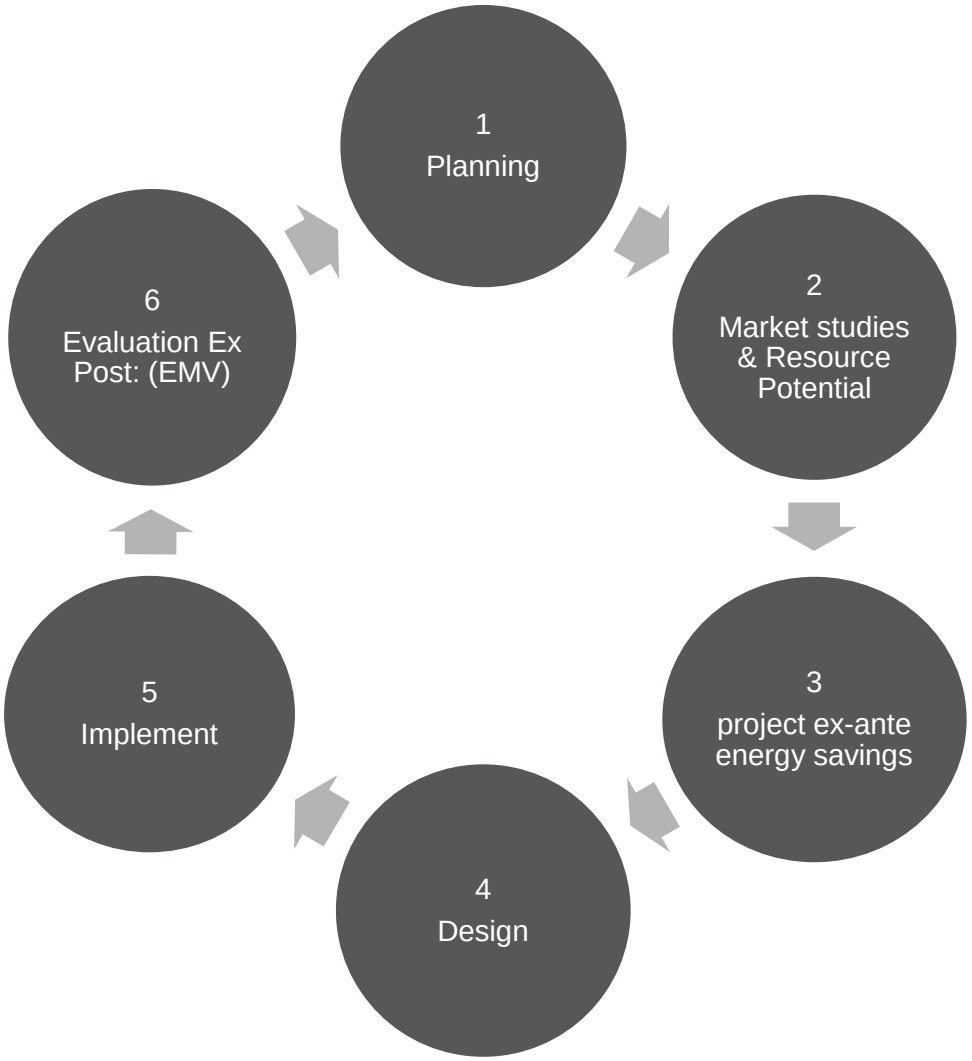
Choosing the right methods for the program/policy to be evaluated:

- **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



NAVIGANT

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

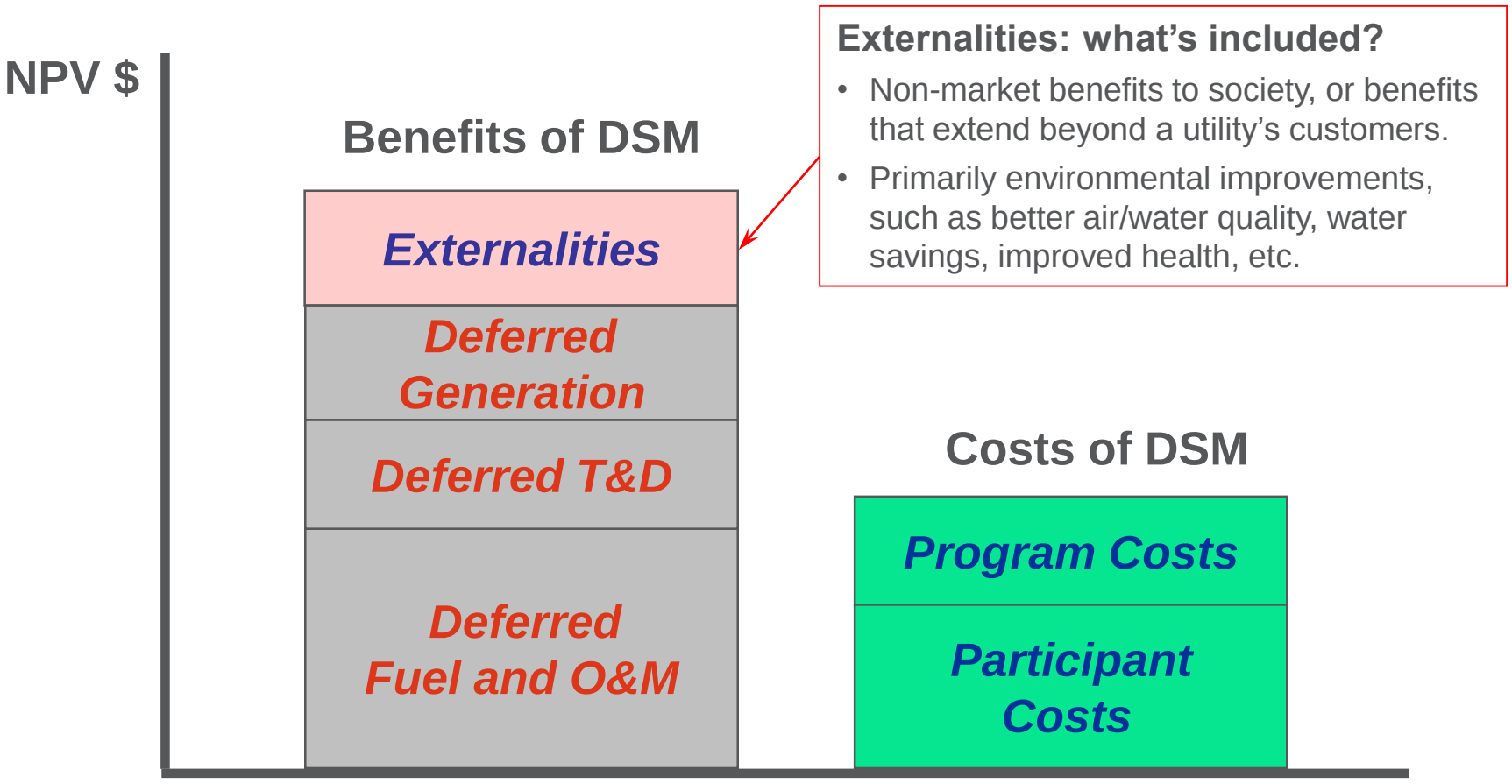
4. Programme/Policy Design
   - Understand the supply chain for product or service
   - Define market intervention strategy
   - Programme theory and logic describe expected outputs & outcomes
     - How do these outcomes impact other areas (jobs, air quality, etc)?

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

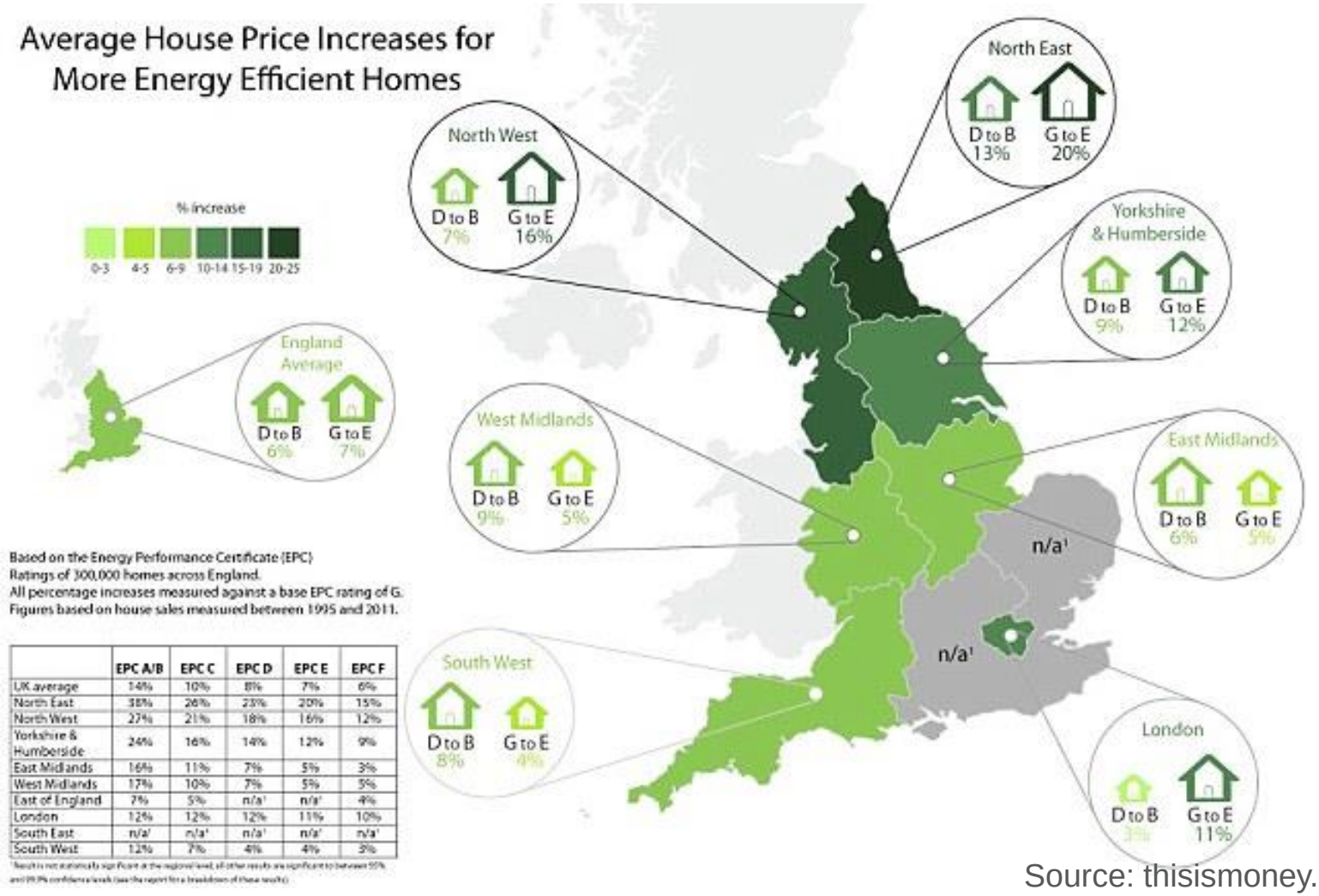
NAVIGANT

CALCULATING MULTIPLE IMPACTS, HOW DO EXISTING TOOLS DO? NET SOCIETAL BENEFITS = SOCIETAL COST TEST (SCT)?



NAVIGANT

GETTING THE DATA FOR THE BENEFITS MAY NOT BE EASY: EXAMPLE: COLLABORATION THAT MEASURES CO-BENEFITS



Based on the Energy Performance Certificate (EPC) Ratings of 300,000 homes across England.
All percentage increases measured against a base EPC rating of G.
Figures based on house sales measured between 1995 and 2011.

	EPC A/B	EPC C	EPC D	EPC E	EPC F
UK average	14%	10%	8%	7%	6%
North East	38%	26%	23%	20%	15%
North West	27%	21%	18%	16%	12%
Yorkshire & Humberside	24%	16%	14%	12%	9%
East Midlands	16%	11%	7%	5%	3%
West Midlands	17%	10%	7%	5%	5%
East of England	7%	5%	n/a¹	n/a¹	4%
London	12%	12%	12%	11%	10%
South East	n/a¹	n/a¹	n/a¹	n/a¹	n/a¹
South West	12%	7%	4%	4%	3%

Source: thisismoney.co.uk

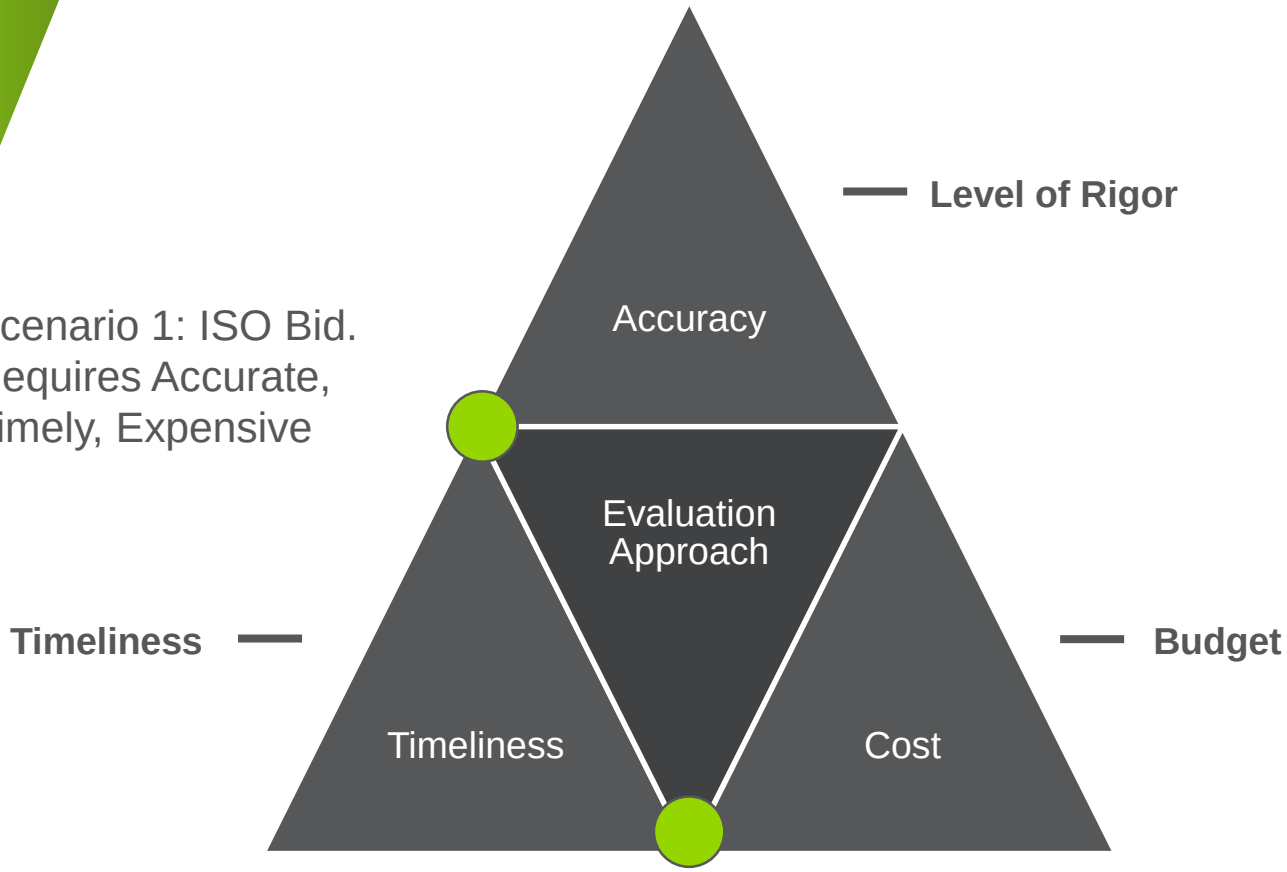
NAVIGANT

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

NAVIGANT

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

---

- 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
  - Anca Moldoveanu, Anna Cronin de Chavez, Christian Stenqvist, Clemens Rohde, Francisco Zuloaga, Hector Pollitt, Hilary Thomson, Ian Hamilton, Janet Gilbertson, Jean-Sébastien Broc, Josefine Rasmussen, Karla Kwiatkowski Lepetitgaland, Kathleen Gaffney, Luis Mundaca, Raghu Sudhakara, Robert Lung, Sam Jenkins, Ulrich Bang, Zoltan Kapros

- Questions

CONTACT INFO:

KEVIN COONEY, MS, PE

Managing Director

Kevin.Cooney@navigant.com

+1.303.728.2510

WWW.NAVIGANT.COM