How to finance energy efficiency in manufacturing

Steven Fawkes

13 June 2024

Fifty Pounds
£50
AA30 969819
SPECIMEN
I sell here, Sir, what
world desires to have
I can think of nothing else
but this machine
SPECIMEN
Bank of England
MATTHEW BOULTON 1728-1809
JAMES WATT 1736-1819
AA30 969819
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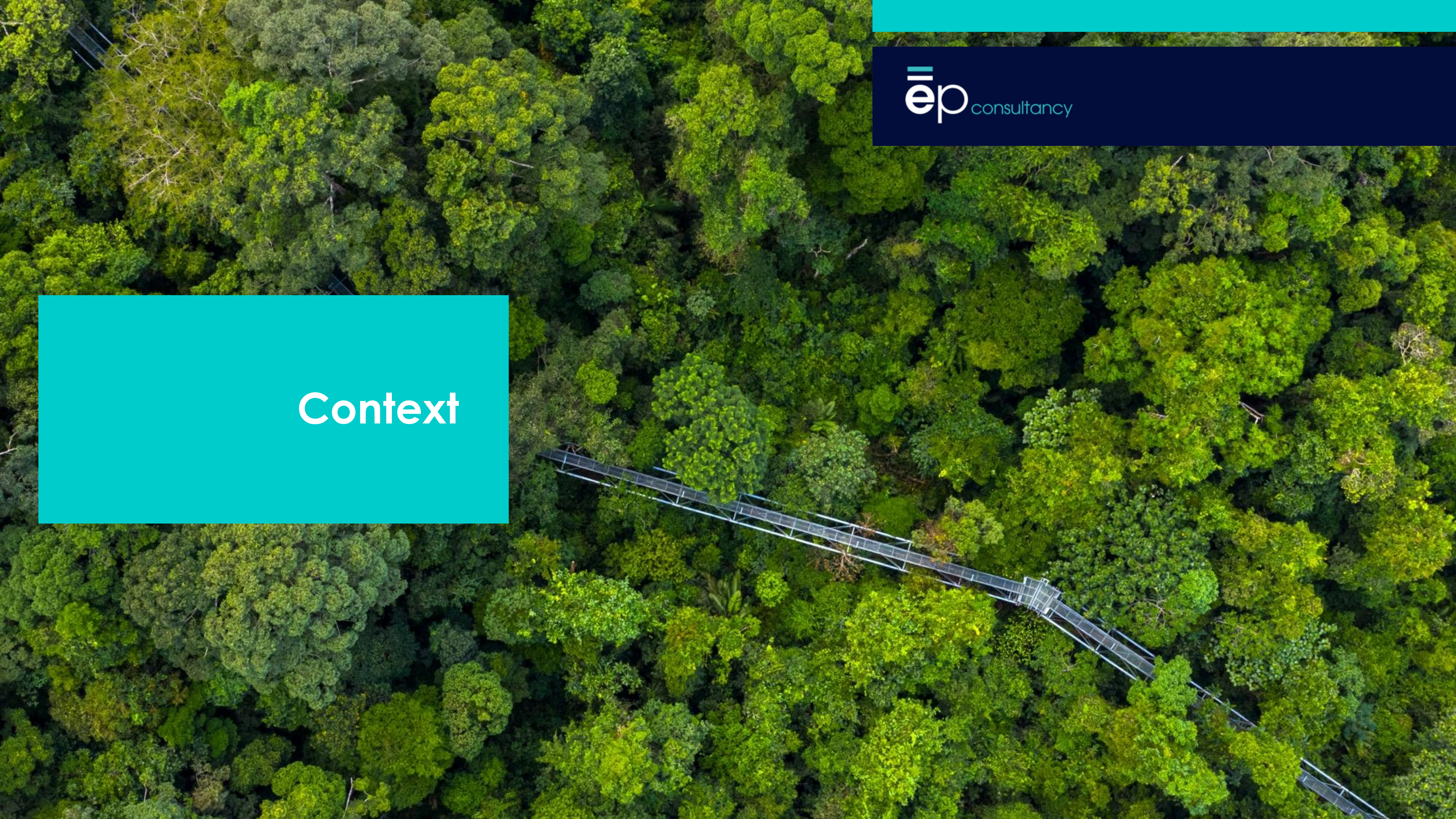


Context

The rise of sustainable finance

- **ESG assets may hit $40 trillion by 2030, 25% of global Assets Under Management (AUM)**[1]
  - Even with healthy degree of skepticism and allowing for 'green washing' this is positive
  - Affects all instruments: equity/debt/bonds/ETFs
- Driven by:
  - Policies e.g.EU Sustainable FInance Taxonomy
  - Investor / customer pressure
  - Recognition of climate & other risks including biodiversity
- More to follow globally
  - SEC Task Force
  - Task Force on Nature-related Financial Disclosures

'ESG is nothing less than an all-encompassing shift in the investment landscape; placing financial and non-financial performance criteria on a level playing field.'

Source: 2022. The growth opportunity of the century. pwc. https://www.pwc.lu/en/sustainable-finance/docs/pwc-esg-report-the-growth-opportunity-of-the-century.pdf

[1] https://www.bloomberg.com/company/press/global-esg-assets-predicted-to-hit-40-trillion-by-2030-despite-challenging-environment-forecasts-bloomberg-intelligence/

Finance and energy efficiency

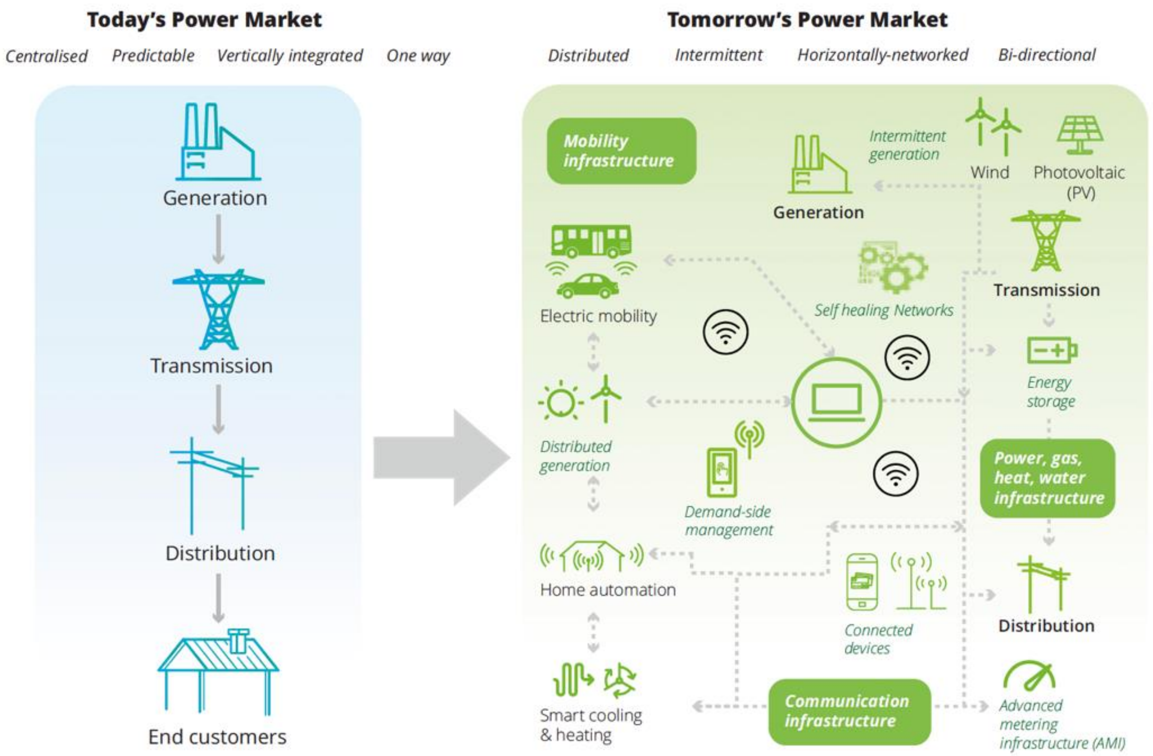
- Financial institutions are increasingly interested in funding decarbonisation and energy efficiency for 4 reasons:
  - Pressure to decarbonise portfolios because of **regulation & disclosure requirements** such as TCFD
  - **Risk reduction**
    - Improved cash flow of clients
    - Avoiding risk of stranded assets
  - **Large market opportunity**
  - **CSR / ESG**

The emerging grid

"The electricity market is in transition to a distributed, variable renewable, storage, multi-directional, cross-vector system"

'Consumers becoming prosumers'

'Buildings and factories becoming batteries and power stations'



Source: Deloitte

Context – falling PV & battery costs

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Battery prices down 14% this year, says BloombergNEF

BloombergNEF says it has recorded a 14% decline in battery prices this year, mainly due to cheaper raw materials, following an unprecedented rise in 2022.

DECEMBER 1, 2023 PILAR SÁNCHEZ MOLINA

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Battery Prices Are Falling Again

Lithium-ion battery pack prices

Volume-weighted average in real 2023 dollars

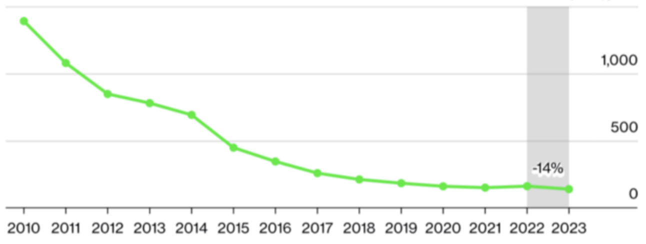

Image: BloombergNEF

2023

World's largest EV battery maker set to cut costs in half by mid 2024

JANUARY 25, 2024 · 13 COMMENTS · 1 MINUTE READ · DANIEL BLEAKLEY

2024

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Why Solar Panels Will Likely Keep Getting Cheaper

NEWS RELEASE

China's solar production costs fall by 42% in last year

New Horizons report says US and Europe can't compete with Asia manufacturing powerhouse

14 December 2023 | 2 minute read

Evwind, News Menu, Other renewables, photovoltaic, Uncategorized

Photovoltaic production chain costs fall in the international market

March 16, 2024 reve

We are in a unique time

For **the first time** we have four drivers for energy efficiency working in the same direction:

Driver	Strength
Environmental pressure	Weak
Energy security (including grid constraints)	Strong
Economics (especially solar and storage)	Stronger
Financial institutions pushing for decarbonisation	Strongest

Barriers

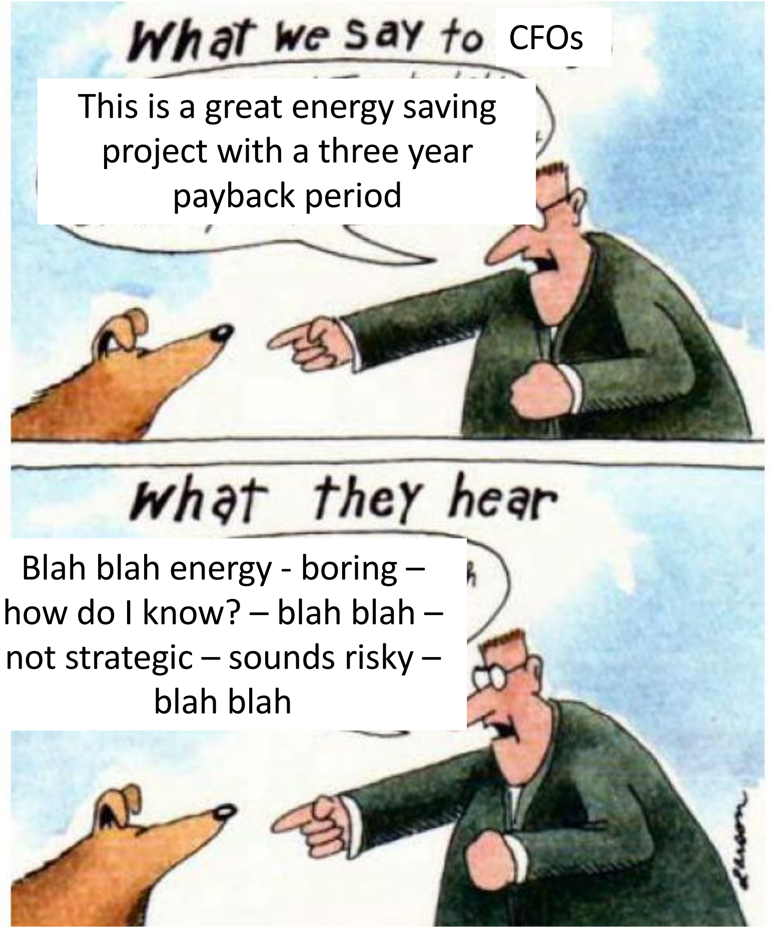
Barriers to energy efficiency

- Lack of standardisation
- Outcomes rarely measured
- Outcomes uncertain i.e. unknown risks
- Projects are small compared to needs of institutional investors
- 'Offensive' spending prioritized over 'defensive' spending
- Lack of capacity in:
  - financial institutions and CFOs
  - supply chain
  - end-user decision makers
- Traditional contracting models like Energy Performance Contracts don't actually work well – especially in real estate, industry and residential sectors
- Etc. etc.

Barriers in industry

- **Dominance of process**
  - ‘Process is king’
  - ‘Don’t mess with my process’
  - Myths and legends such as: ‘the use of combustion heating adds to the flavour of the beer’
  - Energy efficiency often confined to ancillary services rather than process
- **Conservatism of industry & major technology providers**
  - ‘Here is the last one we designed – it works’
- **Change of process is:**
  - Expensive, high-risk, and only happens at certain times in the cycle – maybe once every 20+ years

Language is always a barrier



Finance people and energy people speak a different language.

We need to work to improve communications.

We need to have 'interpreters' & communications tools.

Solutions

Sources of funds

- Public grants
- Financial institutions
  - Specialised energy efficiency / energy transition funds
  - Banks
  - Asset finance companies
  - Infrastructure funds (larger projects)
  - Pension funds (larger projects)
- Public banks e.g. UK Infrastructure Bank, EIB
- Corporates
  - e.g. partnerships such as Schneider and Kyrotherm
- Peer-to-peer platforms e.g Abundance, Ethex
- Blended public / private

Project developers need to understand the different investment and lending criteria.

No shortage of money but not all money is the same.

Project development process

Standardization

Procurement frameworks

Project Development finance & assistance

Facilitators & Capacity Building

Transaction enablers

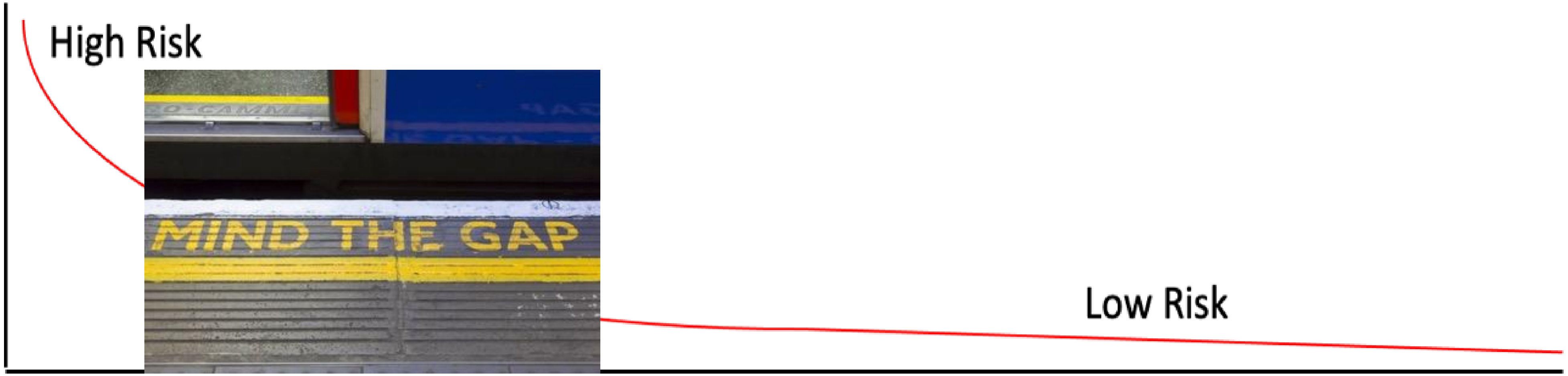
Energy Service Companies (ESCOs)

Guarantees

Insurances

Derisking tools

Origination	Development	Underwriting	Investment	Operation

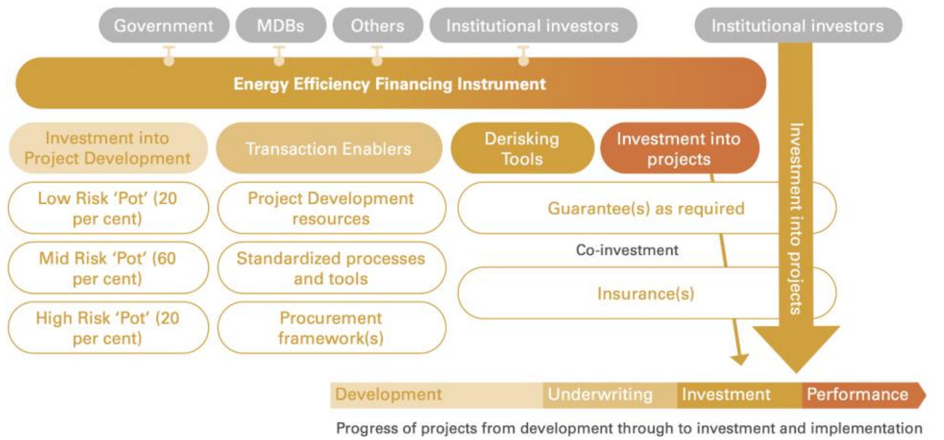


Financing instruments

We need to mobilize private capital

Specialized financing instruments can help by using **small amounts of public money** to:

- develop **transaction enablers**
- provide **derisking tools**



Source: Compiled by author, ESCWA.

Combining finance with delivery

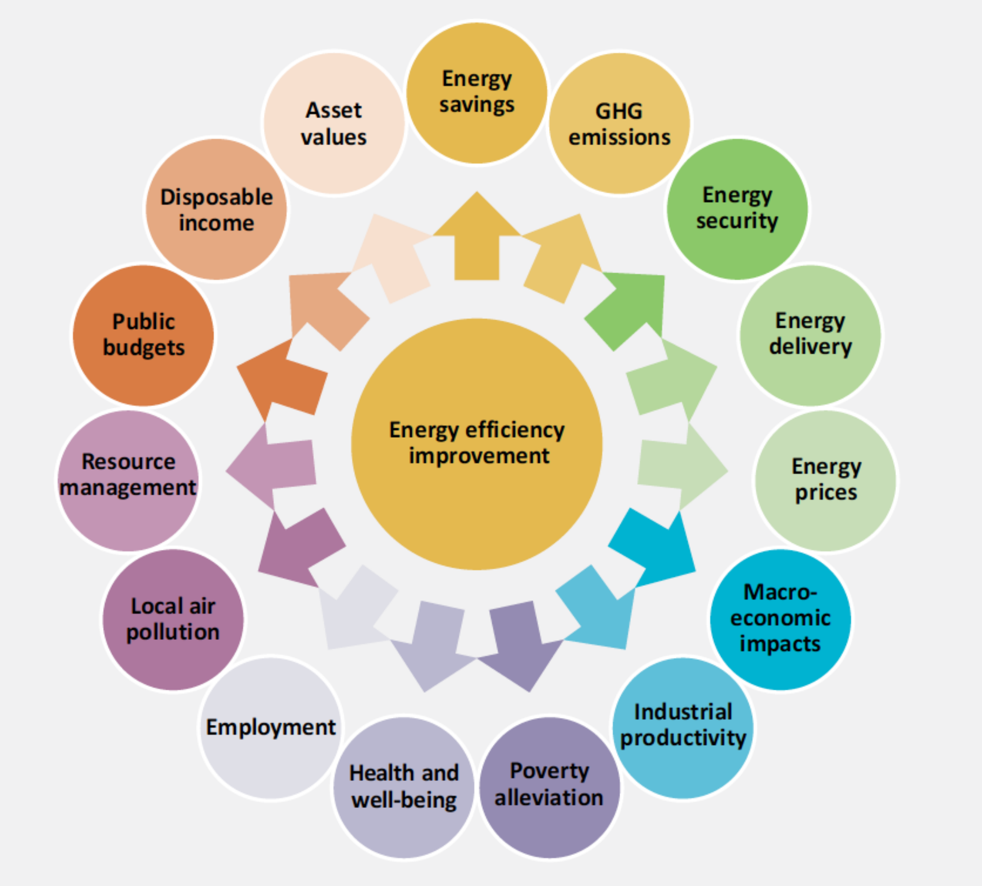
- **Traditional Energy Services Company (ESCO) approach**
  - Complex
  - Only really suited for large projects (multi millions £)
  - High transaction costs
  - Does not address process
- **Energy as a Service models**
  - Managed Energy Service Agreements
  - Metered Energy Efficiency Transactions
  - Sustainable Energy as a Service
  - Lighting as a Service
  - Comfort as a Service
- **Power Purchase Agreements**
  - Pay per kWh
  - Suited to solar and increasingly batteries, heat pumps and other measures

Don’t forget multiple benefits

Energy efficiency brings **many diverse benefits** over and above energy savings and carbon emissions reductions.

These can be **more strategic** and relevant to decision makers than just energy or cost savings.

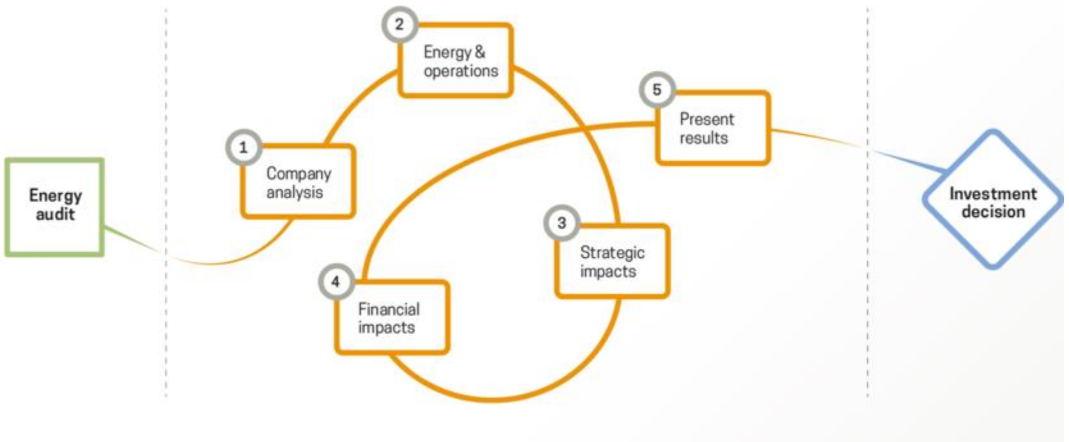
Benefits like **increased productivity**, increased asset value etc. can be **far more valuable – and more interesting** to decision makers - than just energy and carbon savings.



Source: IEA

Build better business cases

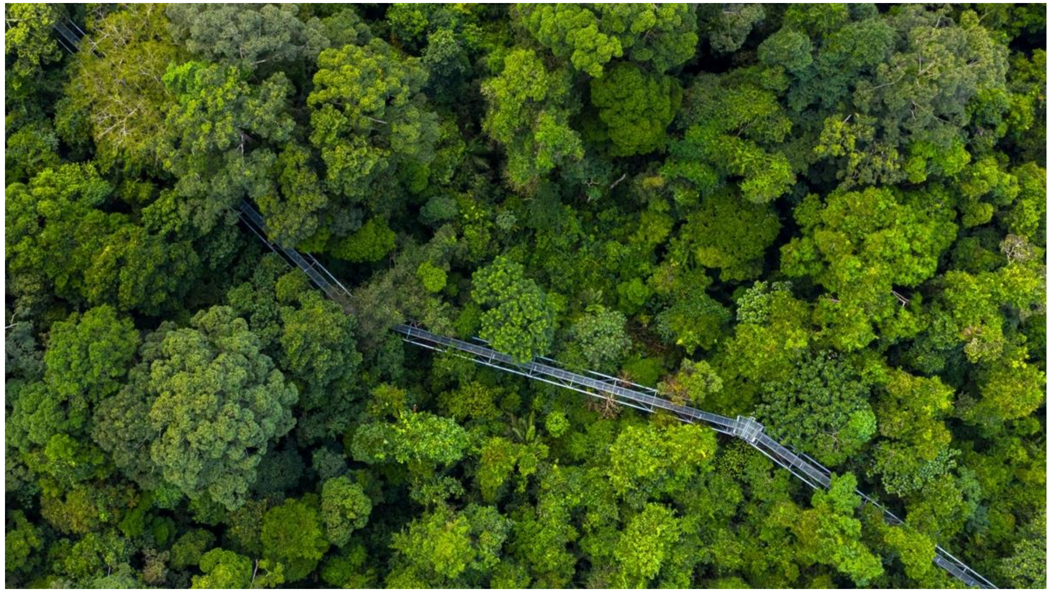
- Start with understanding the **strategic drivers** of the investor / owner
- Identify all Non-Energy Benefits (NEBs) and their value
- **Link NEBs to strategic direction** – how do they create strategic value?
- Appraise **strategic & financial value of NEBs** *(not an exact science)*
- Appraise **value of energy and carbon savings**
- **Risk assessment**



Source: Mbenefits project. https://www.mbenefits.eu

Recommendations

- **Early on in the project** development process
  - Decide on a financing strategy (a high-level strategic decision)
  - Decide on a contracting approach
  - Embed the financing aspect into project development
  - Engage with potential funders to gauge interest and understand their criteria
- **Build better business cases**
  - Assess all the benefits – not just energy and carbon savings
  - Understand the risks – all projects have risks
- Build an **investment grade model**
- **Engage with a facilitator** who understands the market



An example: IETF

IETF

- UK government programme to support industrial energy efficiency & decarbonisation **project development and deployment**
- Provides grants for
  - Feasibility studies
  - Engineering studies
  - deployment
- Phase 1
  - £40 million
- Phase 2:
  - £60 million
- Phase 3
  - £185 million through 2024
  - Expanded eligible sectors

GOV.UK

Industrial Energy Transformation Fund

The Industrial Energy Transformation Fund (IETF) supports the development and deployment of technologies that enable businesses with high energy use to transition to a low carbon future.

Some IETF projects

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- **Kiln exhaust heat recovery into hot oil for use in ceramic drying chambers**
  - Will allow removal of gas burners, primary air fans & waste heat supply fans
  - 10% reduction in carbon emissions
- **Deep decarbonization of sugar refinery**
  - Potential 90% reduction in carbon emissions
- **Decarbonizing precast concrete manufacturing**
- **Glass furnace efficiency improvements**
  - Including power generation from waste heat (ORC)
- **Refinery deep decarbonization**
  - Fuel switching to renewable hydrogen
- **Advanced cryogenic carbon capture for small and dispersed industrial site**

The energy efficiency first principle

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We miss opportunities every day

- ***Every single day*** loans and investments are made where the *economic* potential for energy efficiency and decarbonization are not being exploited – **locking in excess energy use, costs and emissions**

- **Why does this happen?**
  - Lack of capacity on supply side, demand side and finance industry
  - The need for speed
  - Standard supply side solutions are developed
  - Financial institutions don't want to add 'bureaucracy' and hamper themselves in relation to competition
  - Typically they review projects as they are delivered to them and are not proactive in their development

- **How do we make sure we don't miss these opportunities?**

- Banks and investors need to adopt '**Energy efficiency first**'

Energy efficiency first

- **Energy efficiency first** is a central pillar of EU energy policy

- It means that energy efficiency options *should* always be considered as an alternative to energy supply options

How can we adjust the processes of financial institutions to encourage, or require, project hosts and developers to develop projects that incorporate, at least, the cost-effective energy efficiency opportunities?

This is the most important question we face.

EEFIG Energy Efficiency First Working Group

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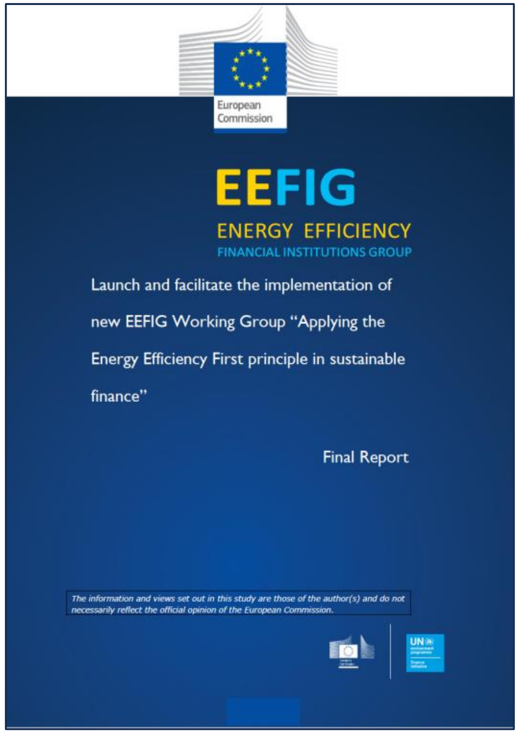
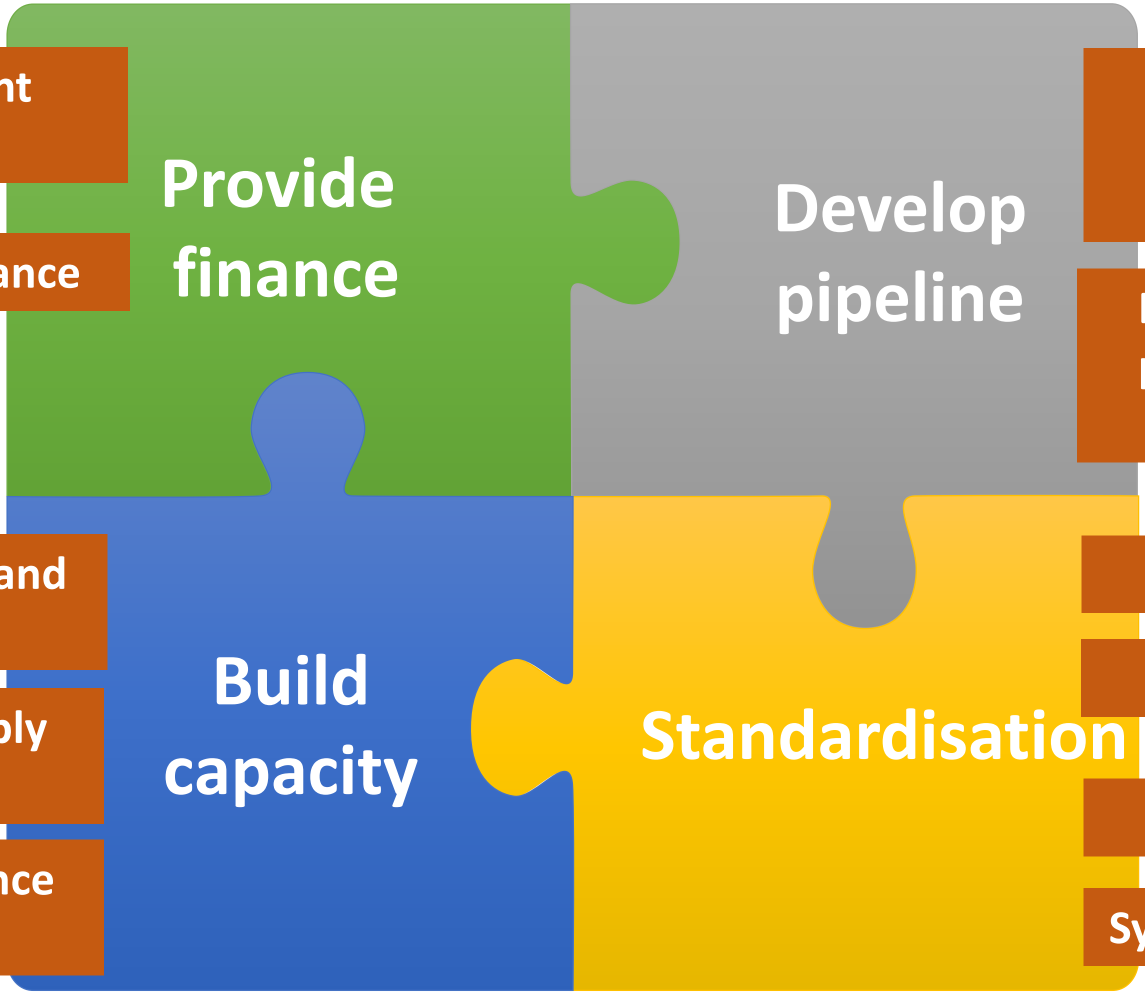
- **Studied practices** on energy efficiency within public and private financial institutions
- **Identified processes and tools** that could help financial institutions operationalize energy efficiency first
- Concluded that **tools are required at 3 levels**:
  - Policy and governance
  - Portfolio
  - Deal
- **Provided examples of tools** in use already:
  - D-fine and SkenData portfolio tool
  - Green Technology Selector
  - Investor Confidence Project protocols
  - International Performance Measurement and Verification Protocol
- **Made recommendations** for policy makers and financial institutions



Conclusions and recommendations

To scale private finance we need

- Project development finance essential
- Long term project finance
- Build capacity in demand side (end users)
- Build capacity in supply side (supply chain)
- Build capacity in finance industry



- More attractive business models targeting deep decarbonization & whole system thinking
- Build development & aggregation platforms based on whole system thinking
- Development process
- Technical solutions
- Contracts
- Systems & Underwriting

In conclusion

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- There is increasing interest in financing energy efficiency and **growing amounts of capital** looking to invest or lend to energy efficiency projects
- But there are **many barriers** to be overcome including the language barrier
- Financing and delivery mechanisms need to be considered as a central part of the project and programme development
- There is an increasing array of delivery mechanisms that can be linked to finance
- In any financing programme, whether it be national or corporate, we need to include **transaction enablers** and **derisking tools**
- Getting financial institution to truly **adopt energy efficiency first** is likely to be the most powerful lever we have – the EEFIG work is a start in this direction.

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