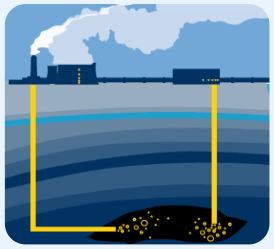








Energy efficiency investments

Promoting and Financing Energy Efficiency in Ireland and the United Kingdom

28th September 2017

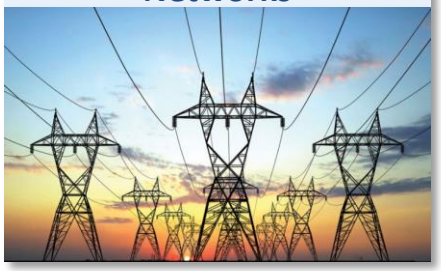
Element Energy Ltd

Shane Slater, Director

Element Energy is a consultancy focused on the low carbon energy sector

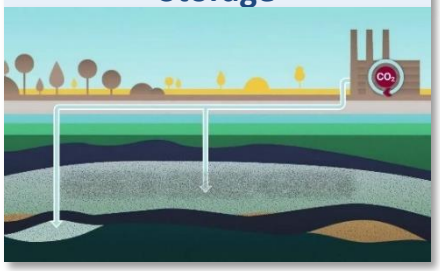
- Element Energy is a **specialist energy consultancy**, with an excellent reputation for rigorous and insightful analysis in the area of low carbon energy
- We consult on both **technical and strategic issues** – our technical and engineering understanding of the real-world challenges support our strategic work and vice versa
- Element Energy covers all major low carbon energy sectors:

Smart Electricity and Gas Networks



Energy Storage

Carbon Capture and Storage



Hydrogen

Low Carbon Transport

Built Environment

Our clients span the public and private sector in the UK and across Europe

- Our work with public sector clients, from local authorities to national government departments and international NGOs, has influenced policy decision making at all levels
- Private sector clients encompass both start-ups looking to commercialise and large multi-national corporations

Selected clients:

Public sector

Department for Transport
Department of Energy & Climate Change
Department for Communities and Local Government
Committee on Climate Change
TRANSPORT SCOTLAND
Transport for London
GREATER LONDON AUTHORITY
scottishcitiesalliance
Birmingham City Council
Roinn Cumarsáide, Fuinnimh & Acmhainní Nádúrtha
Department of Communications, Energy & Natural Resources
seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND
EUROPEAN COMMISSION

NGOs

iea International Energy Agency
European Climate Foundation
TRANSPORT & ENVIRONMENT
icct THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION
WORLD BANK GROUP
UNDP

Public-Private Partnerships

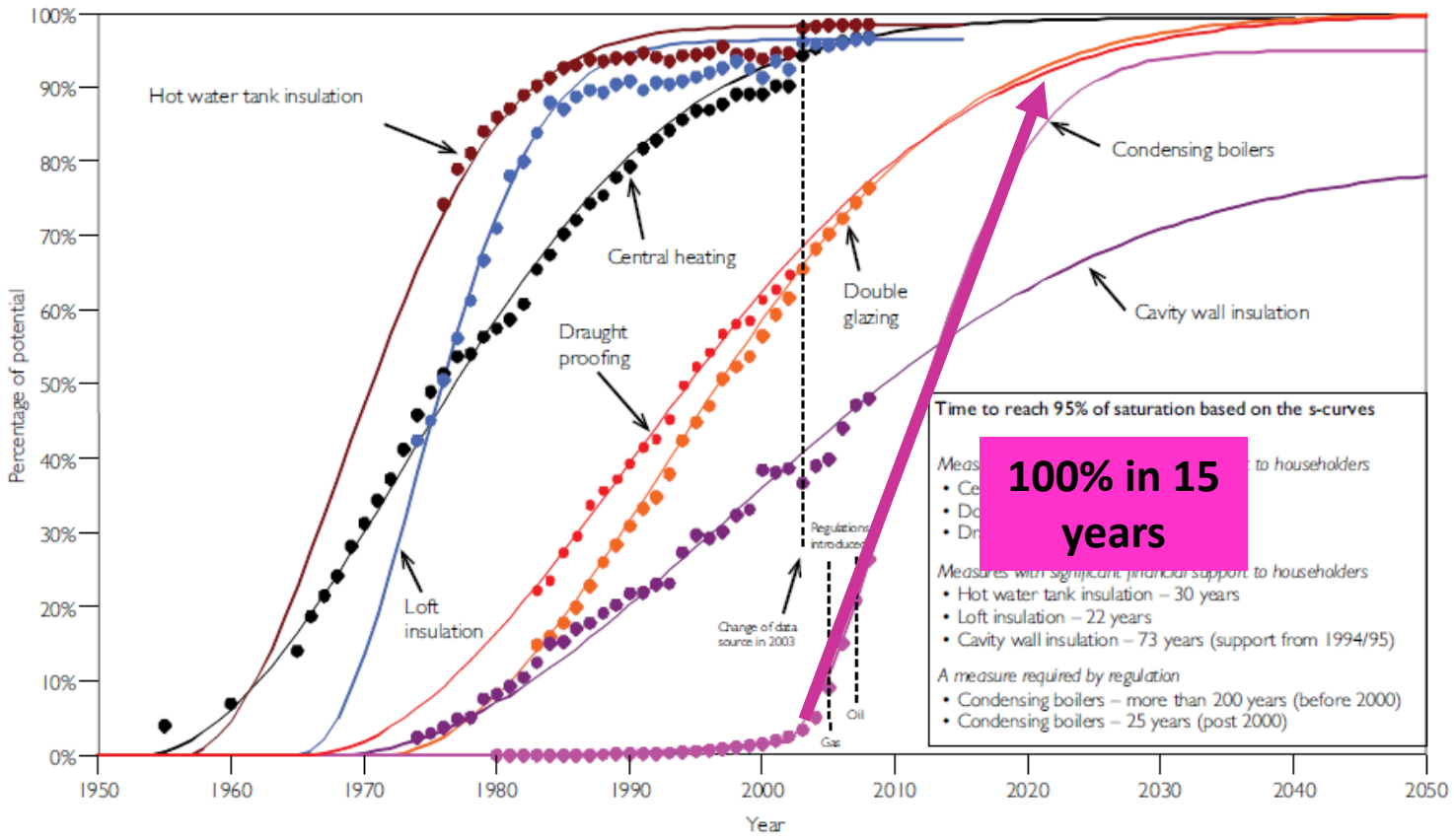
energy technologies institute
UK H_2 Mobility
LowCVP low carbon vehicle partnership
FCH FUEL CELLS AND HYDROGEN JOINT UNDERTAKING

Private Sector

British Gas
nationalgrid
EDF ENERGY
Scottish and Southern Energy
UK Power Networks
INTELLIGENT ENERGY
ESB Energy for generations
AIR PRODUCTS
bp
BOC Member of The Linde Group
NISSAN
Rolls-Royce
TOYOTA
DAIMLER
zipcar

Legislation has always underpinned energy efficiency in the building sector

Condensing gas boilers installations (UK): from 170 to 1850/day in year after legislation



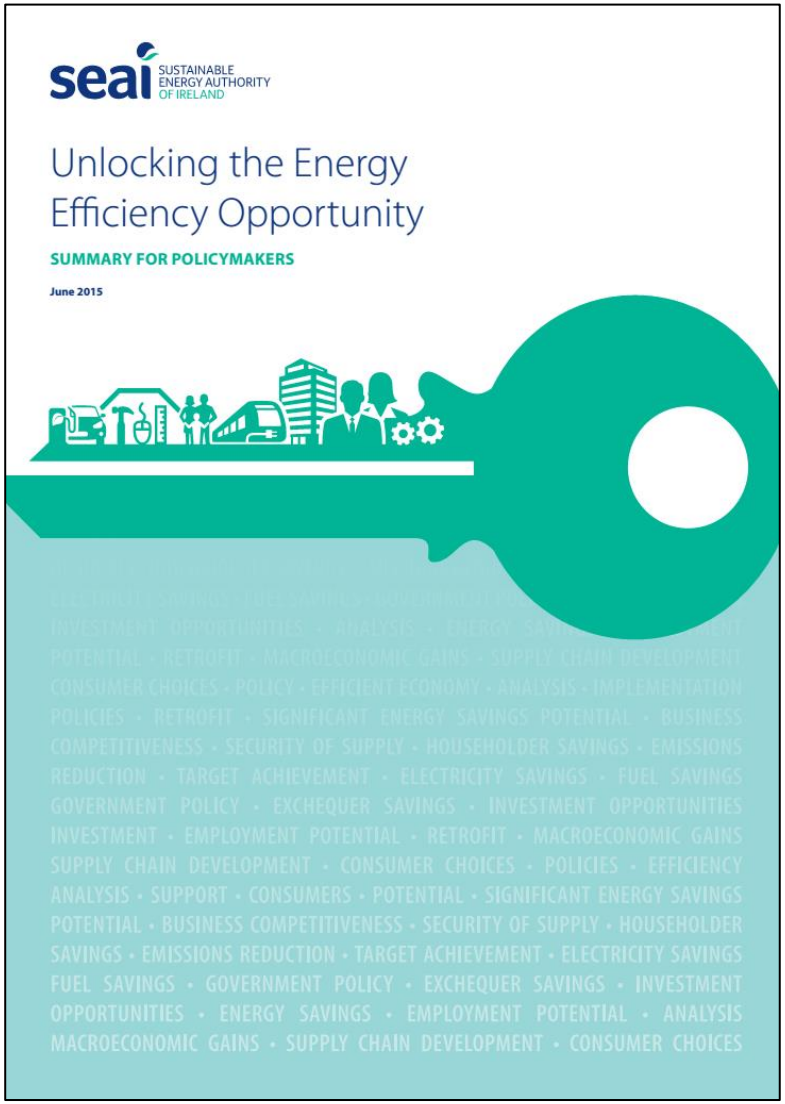
Exposed to Policy risk? Direction of legislation is clear, particularly for worst-performing building stock

European legislation and support

- **EU Energy Efficiency Directive:**
  - Non-binding target of 20% energy saving by 2020 and non-binding target of 30% by 2030 compared to 1990 levels.
  - Energy Efficiency Obligations (or alternative policy) to achieve reduction in final energy use of 1.5% per year
- **Energy Performance in Buildings Directive:**
  - Minimum energy performance standards for new buildings
  - Minimum energy performance standards upon renovation (existing buildings)
  - Nearly-Zero Energy buildings (all new buildings from 2021; 2019 for public buildings)
  - National Energy and Climate Plans (NECPs) will be developed by each Member State setting long term renovation strategies with clear milestones to 2030s
  - Mandatory Energy Performance Certification
- **Clean Energy For All Europeans – Accelerating clean energy in buildings:**
  - **"**Focusing on the places where we live and work, the goal is develop a comprehensive, integrated approach *that puts energy efficiency first*"
  - **Smart financing for smart buildings initiative:** The Commission is launching an initiative to unlock €10 billion of funding for energy efficiency and renewables in buildings until 2020

https://www.interregeurope.eu/policylearning/news/1639/eu-energy-council-agrees-non-binding-energy-efficiency-target-of-30-by-2030/

Latent potential: cost effective primary energy savings potential in Ireland is over one-third of national consumption



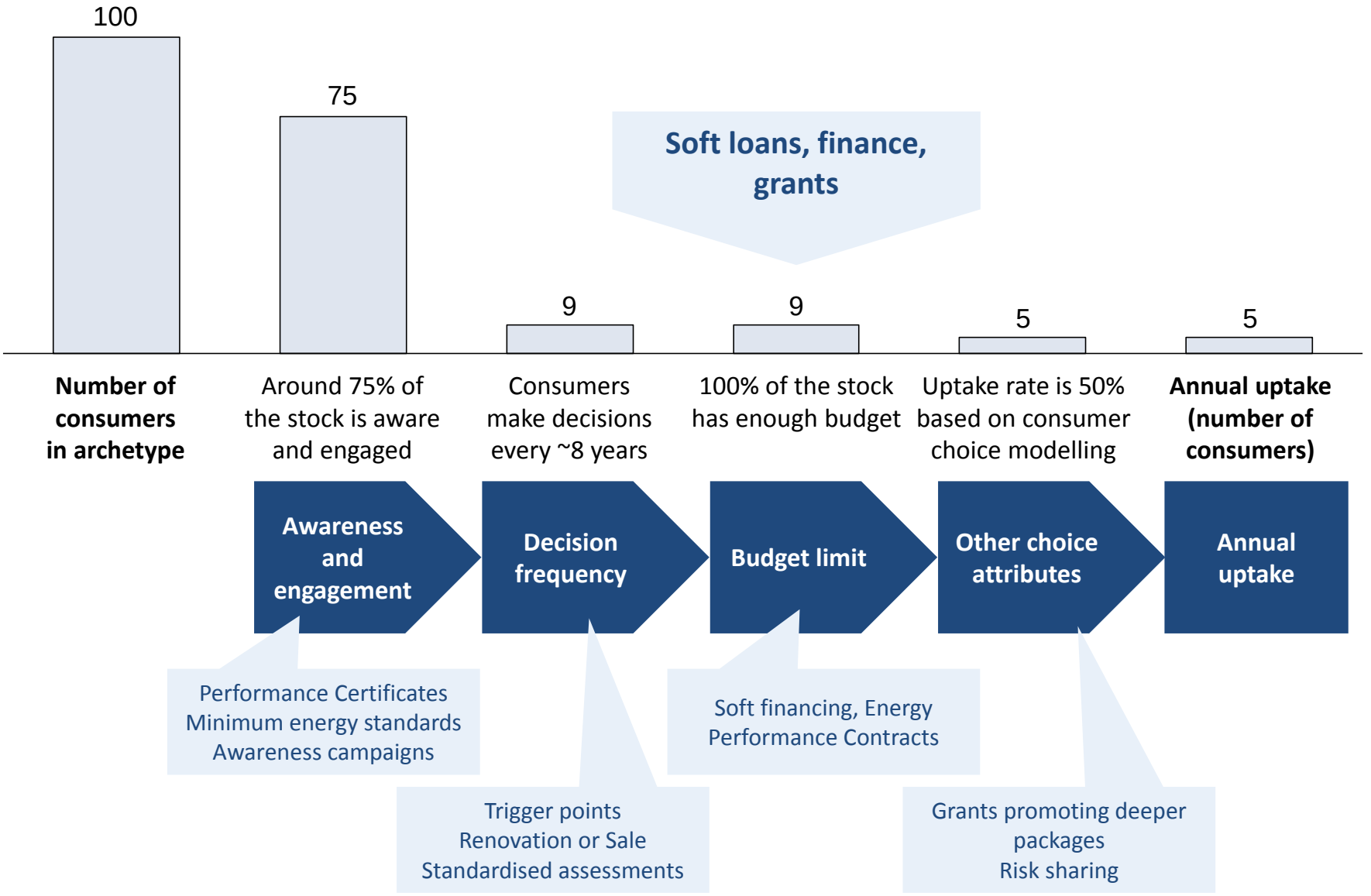
Element Energy-led study for SEAI:

- Assessment of the energy efficiency opportunity across all energy-consuming sectors in Ireland
- Design of concrete and actionable policy interventions to unlock those energy savings
- The study informed the development of Ireland's 3rd National Energy Efficiency Action Plan to achieve a 20% reduction in primary energy demand to 2020

Key findings:

- 2020 target is very challenging
- However, a range of policies including regulation, low-interest loans and targeted grants could allow the target to be met
- **Likely to require a total investment of just over €3 billion…**
- **…but lead to lifetime savings of over €11 billion, and provide a net benefit to the Exchequer of more than €1 billion**

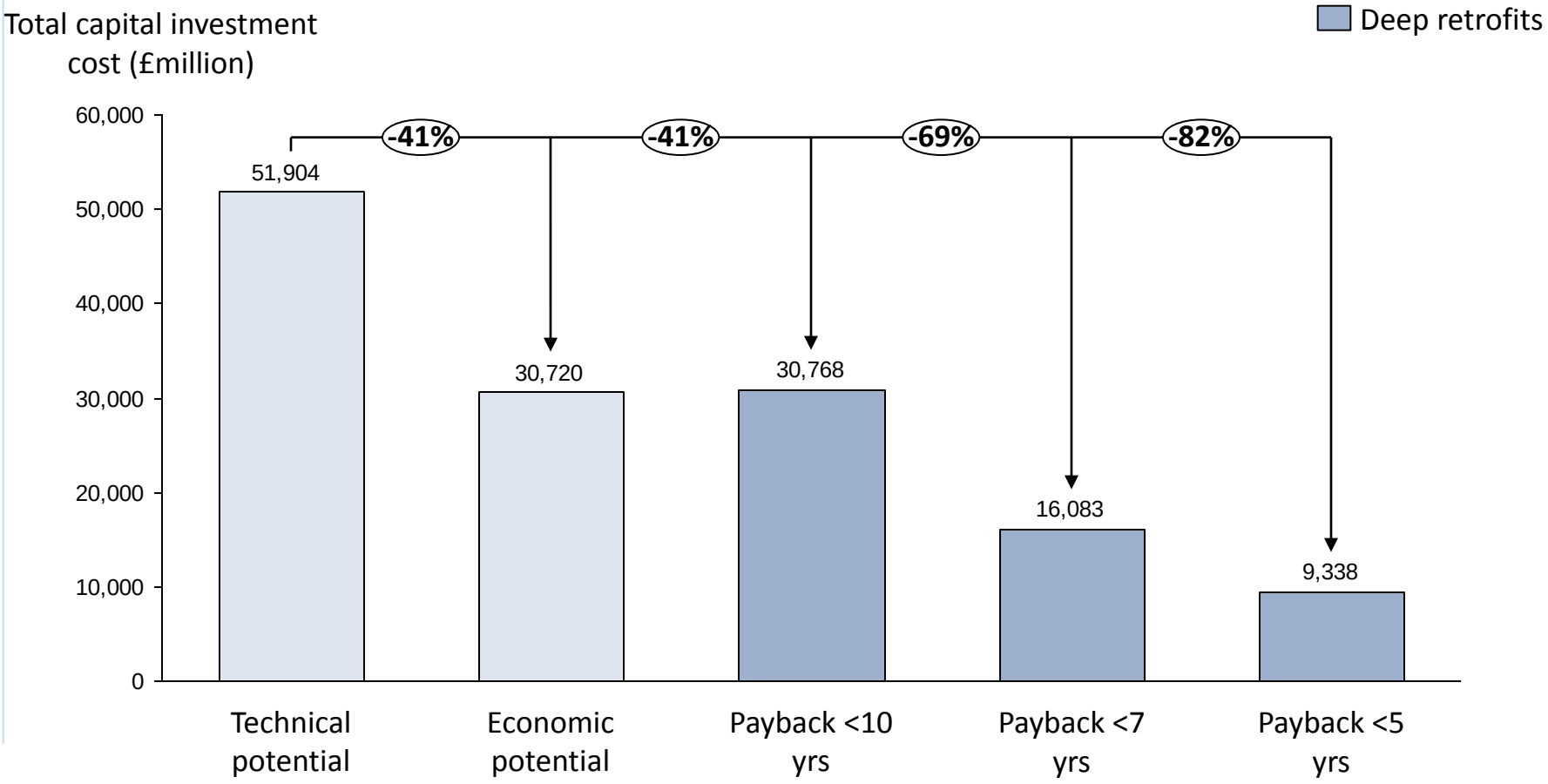
Decision making framework: there are lots of points of attrition. Innovative finance is part of the ecosystem



Source: Element Energy

Most economic potential has > 5 year payback. Shorter payback still worth up to £10 billion (UK data)

Potential for energy efficiency retrofits in commercial and public buildings (£million)



Comparing the features of successful and less successful investment opportunities

Photovoltaics	Thermal efficiency e.g. insulation upgrades
Who benefits from the investment? Electricity generation is metered	• Split incentives • Comfort is a priority
Performance risk Accurate output predictions, mature product	• Performance not as predicted, change in use or behaviour, comfort taking
Assessment, contracts, installation Rapid, highly standardised, competitive	• Time consuming: bespoke data required; not off-the-shelf; contract complexity; hassle during installation
Asset or liability • An asset passed on with building	• Can be seen as a liability – particularly longer term contracts (>2 years!)

Energy service investment models are an improvement but also have limits

Current importance of various barriers to energy services uptake

Potential barriers	Description and current importance
Lack of awareness and understanding	The lack of awareness of the potential of energy services to reduce energy costs and in some cases generate new revenue streams is a major barrier to the uptake of energy services
Cost of producing contracts	The costs involved in producing bespoke contracts is a major barrier. Development of public procurement frameworks has helped the market to grow substantially in the public sector
Split incentives between landlords and tenants	The issue of split incentives between landlords and tenants is a major barrier to uptake of energy services, especially in the commercial and residential sectors
Duration of contracts	Especially in the commercial and domestic sectors. Many consumers are unwilling to be committed to an energy contract for more than a few years
Consumer perception	Many consumers are unfamiliar with contracts of this nature and distrust the contractual guarantees

What can be done to support energy efficiency investments

1. **Enforce minimum standards and regulation**
   - Minimum energy performance requirements for renovation + trigger points.

2. **Cheap data**
   - Better information on energy consumption and costs to encourage activity
   - Design and target investments at very low cost
   - Respond to price signals
   - Verify savings at very low cost

3. **Smart financing**
   - Portfolio diversification decreases underperformance risk
   - Public guarantees
   - Increase trust, partnership with public institutions

4. **Promotion of wider benefits**
   - Air quality
   - Integrate renewables, link buildings with the transport system.

http://ec.europa.eu/energy/sites/ener/files/documents/com_860_final.pdf

Financing deeper energy efficiency needs to work in concert with other big transformations that are occurring more rapidly.

Centralised
Segregated
Fossil-fuel driven

Embedded and distributed generation

Electrification of heat and mobility

Deeper energy efficiency

Increasing participation of consumers

Increasing flexibility of the demand-side (DSR, storage)

Decentralised
Integrated
Renewable