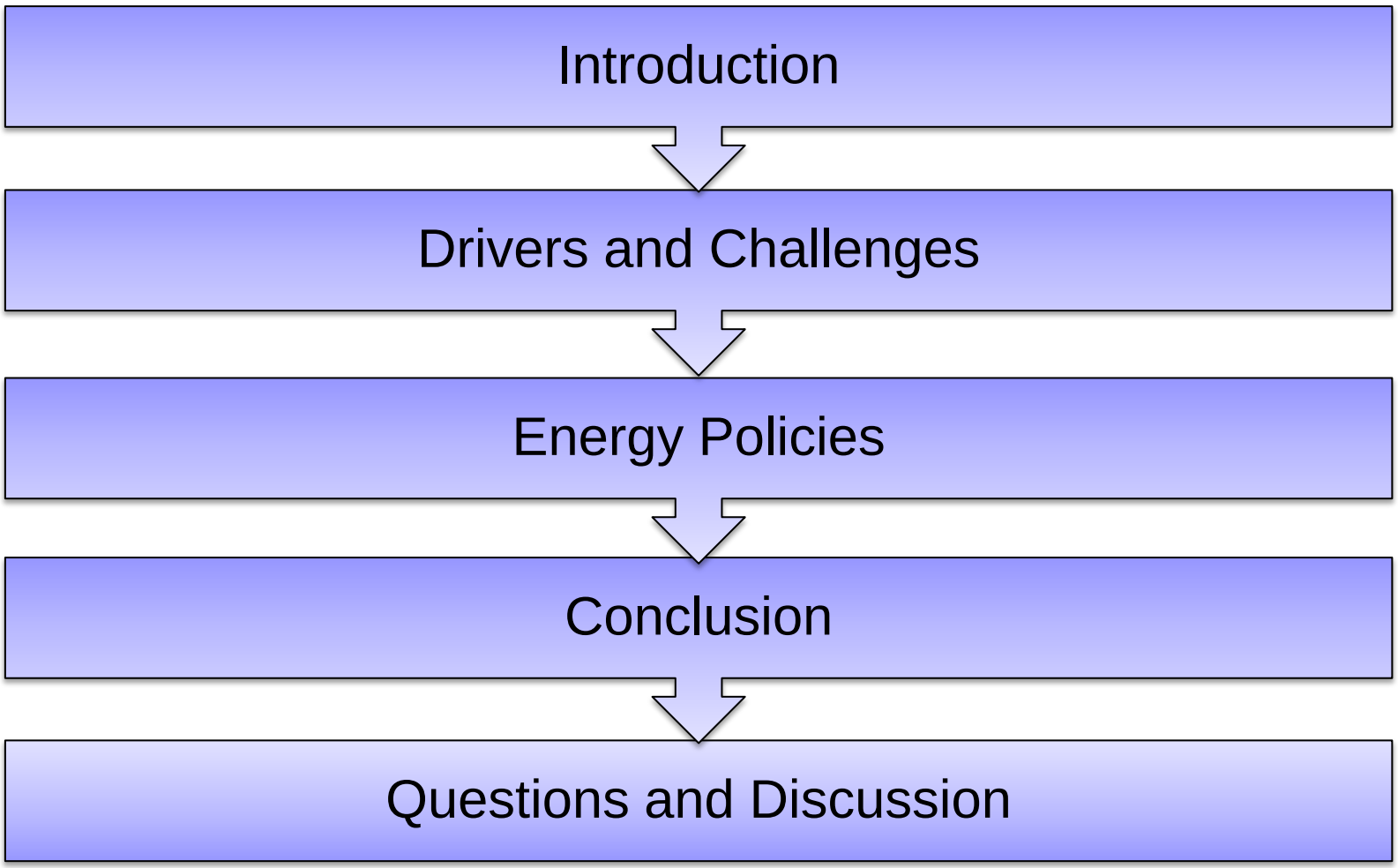
Low Carbon Heating and Cooling for Non-Domestic Buildings in UK

SUSTAINABLE PLACES 2016 June 29–July 1, 2016 Anglet, France

Drivers, Challenges and Energy Policies

By
Divya Deepankar
Research Engineer
Sustainable Construction Group

Presentation Roadmap



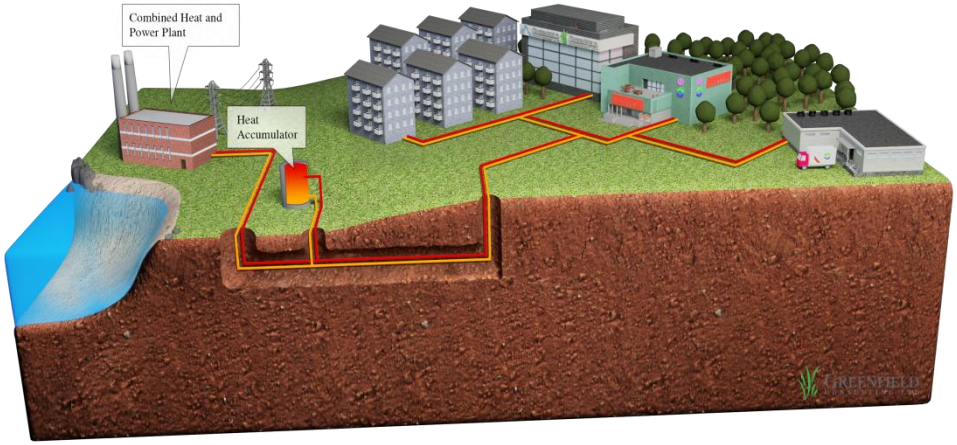
INTRODUCTION

Why Bother?

"As human beings, we are vulnerable to confusing the unprecedented with the improbable… if something has never happened before, we are generally safe in assuming it is not going to happen in the future, but the exceptions can kill you and **climate change** is one of those exceptions."

(Al Gore, 2009)

Low Carbon Heating and Cooling



DEFINITION???

Low Carbon Heating and Cooling

*Technology Types	
• Solar thermal	• Ground source heat pumps
• Biomass	• Water source heat pumps
• Geothermal CHP	• Gas driven heat pumps
• Biogas CHP	• District/ block heating
• Biomass CHP	• District/ block heating (based entirely/ partially on energy from low carbon sources)
• Biomass contained in waste CHP	• District/ block cooling
• Air source heat pumps	• District/ block cooling (based entirely/ partially on energy from low carbon sources)

* EPBD Recast (Directive 2010/31/EU) document : http://www.eceee.org/policy-areas/buildings/EPBD_Recast

UK Emissions Reduction Targets

- **UK Climate Change Act (2008):**
  - 80% reduction in UK's greenhouse gas emissions by 2050 from 1990 levels
  - 34% reduction by 2020*
  - Virtually zero carbon buildings by 2050

- Under **EU Renewable Energy Directive 2009**, UK has a binding commitment to increase renewable energy use to 15% by 2020

*(DECC, 2015) UK Provisional Greenhouse Gas Emissions
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/511690/20160331_2015_Provisional_Emissions_Stats_one_page_summary.pdf

DRIVERS & CHALLENGES

Drivers

- Labelling and Certification Schemes like BREEAM (or LEED, EPC's / DEC's, CSR Reporting)
- Building regulations
- Planning Requirements
- Client ethos/brand

Challenges

- Operational difficulties in low-carbon technologies
- High initial investment
- Planning horizon of organisation
- Access to third party finance

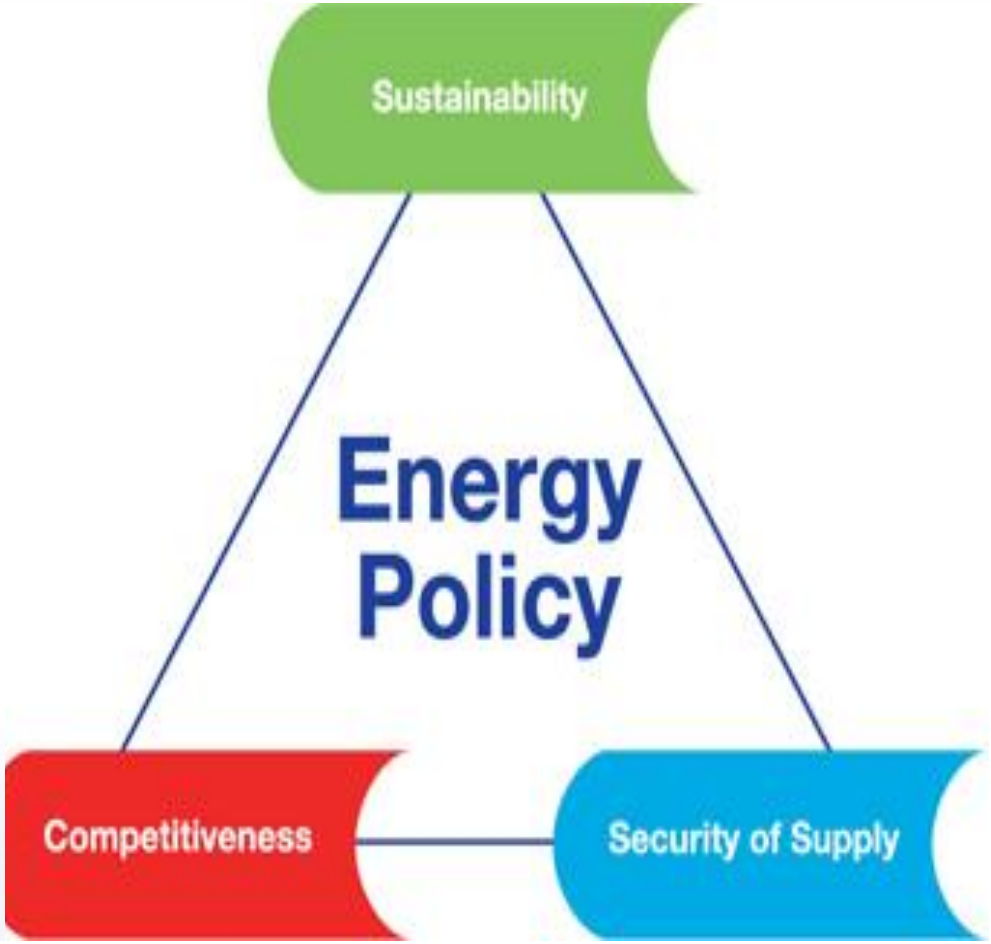
Challenges

- End users market perception
- Changing building regulations
- Landlord- tenant relationships
- Geographic viability

ENERGY POLICIES

Energy Policies

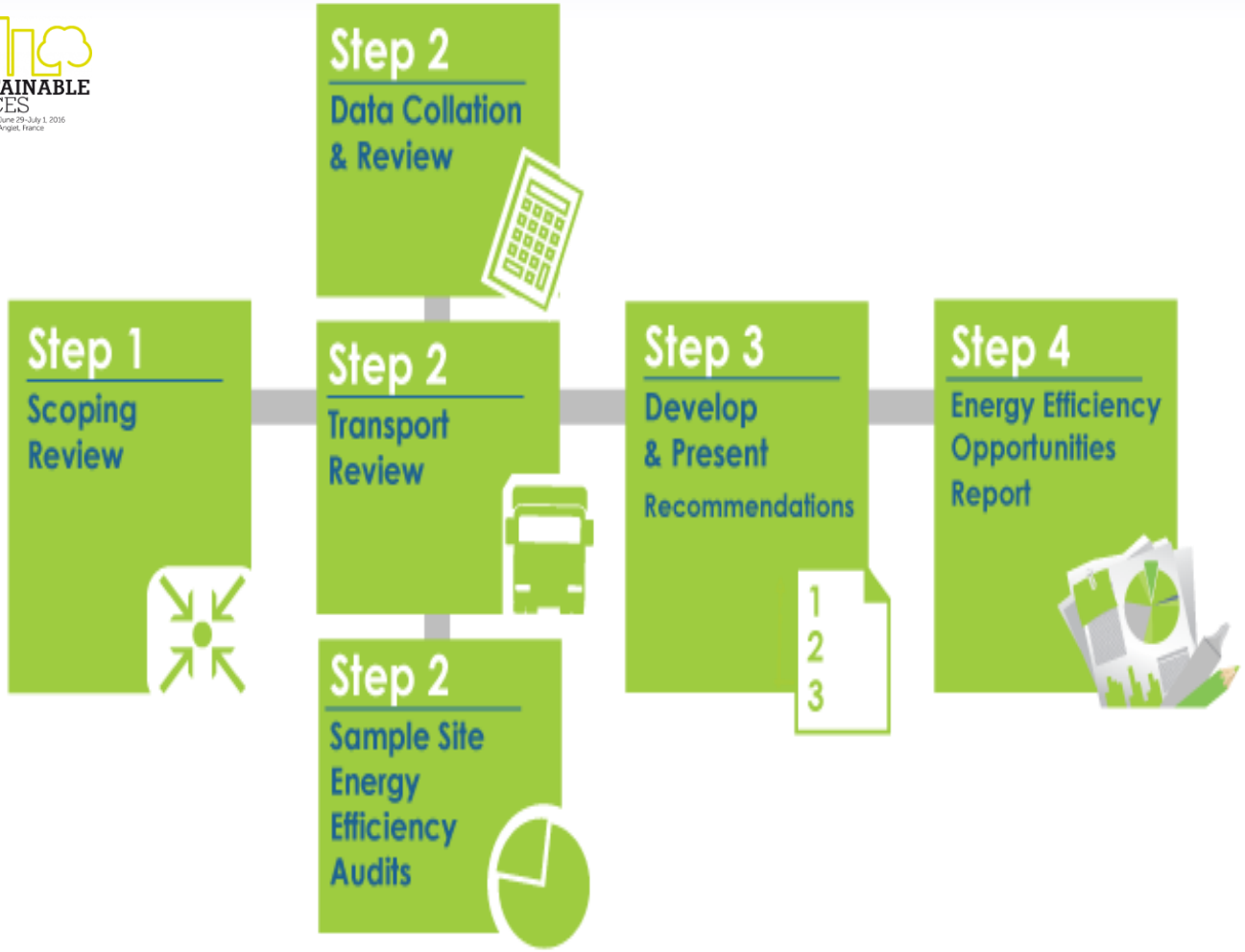
- ESOS
- MEES
- EPBD (NZEB)



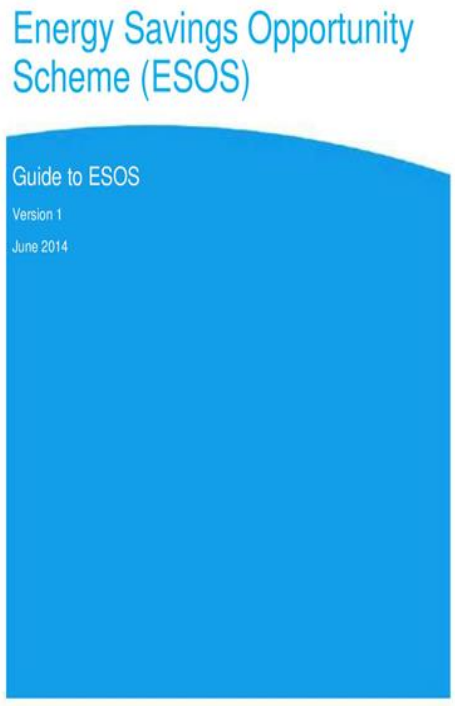
ESOS

- ESOS is a mandatory energy assessment scheme run by the UK Environment Agency for organisations in the UK that meet the stipulated qualification criteria
- The assessments are carried out every 4 years

ESOS

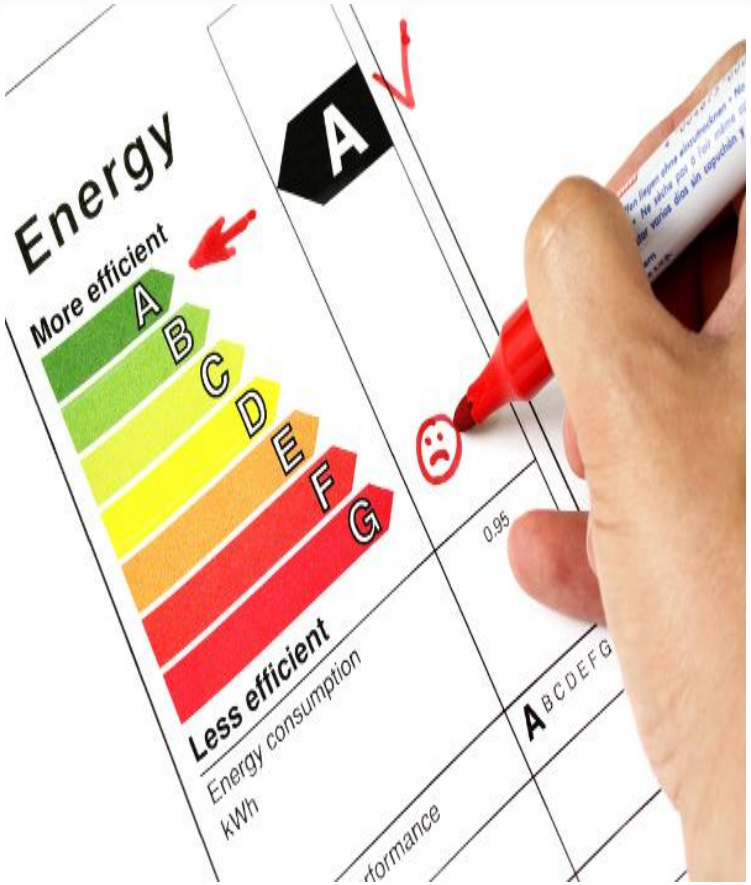


Department of Energy & Climate Change



MEES

MEES is a UK regulation for non-domestic private sector in England and Wales that sets a minimum energy efficiency standard at an ‘E’ EPC rating

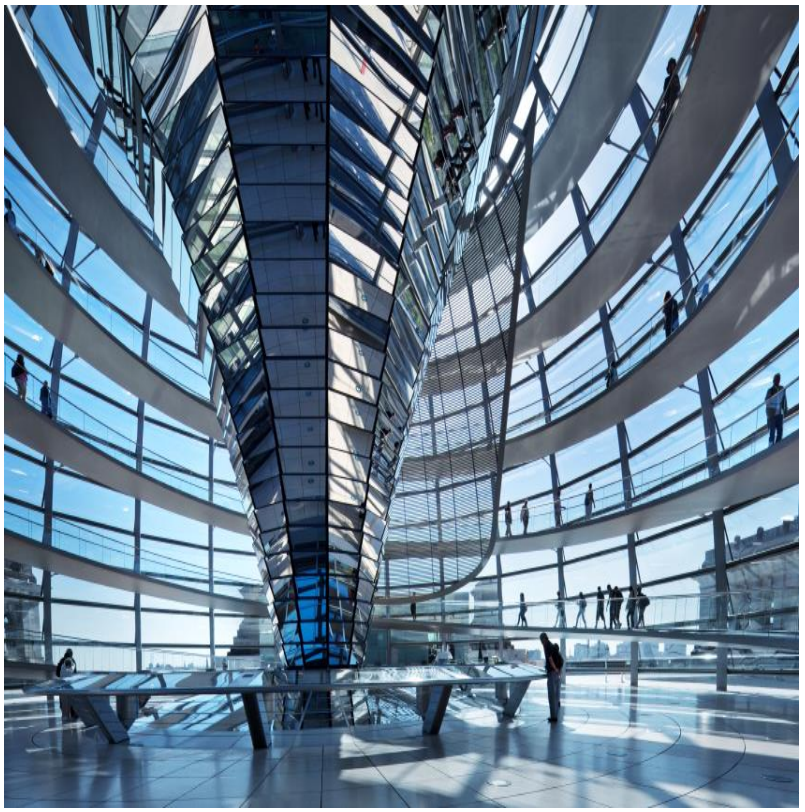


MEES

- From 1st April, 2018 the regulation will make it illegal for a landlord to let out a property with an EPC rating below E
- Absence of financial aids makes high level of compliance a burden on landlords and difficult to sustain

EPBD (NZEB)

- Building that has a very high energy performance
- Energy required should be covered by energy from low carbon sources produced on-site or nearby
- ‘Nearly zero energy’ buildings from 31st December, 2020 (all new public buildings to be nearly zero energy from 2019)



EPBD (NZEB)

- Ambiguity in definition of ‘nearly zero energy’
- A road map is needed setting suitable targets and testing the principles on reference buildings

CONCLUSION

Conclusion

- Low carbon heating and cooling for non-domestic buildings needs to be defined
- Drivers and challenges revolve around whether or not a clear business case can be developed
- ESOS, MEES, EPBD (NZEB) have potential but financial incentives are required

Conclusion

"Climate change is real and our biggest mistake has been underestimating it!" (James Balog, 2016)

THANK YOU

Questions and Discussion

1. Let's brainstorm ideas on what you define as low-carbon technologies.
2. For old, existing dwellings, how do you make it easier to integrate technologies?
3. Do you think targets like NZEB are the right way forward?