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# Introduction

Ally Galloway, Elmhurst Energy



# General Information

- Refreshments provided just outside with lunch served in the Main Restaurant at 12:00am.
- Toilets located outside the room to the left.
- Fire exit doors clearly marked – no alarm scheduled today.
- WiFi is 'Maldron Hotels' – no password needed
- The presentation provided today will be sent to attendees via email after the conference, along with a copy of your CPD certificate.

# Ask your questions with Slido

- Instructions available on your table
- Use your phone or laptop to submit questions that you would like to ask each Q&A panel
- Up vote/like questions – the most popular will be read to our panel

slido

# Agenda – Session 1

| | |
|---|---|
| 10:00 - 10:30 | **Registration** |
| 10:30 - 10:40 | **Conference Opening**<br>Alistair Galloway (Elmhurst Energy) |
| 10:40 - 11:00 | **Why a sustainable future might be low energy and not just a low carbon one**<br>John Barry (Centre for Sustainability, Equality and Climate Action) |
| 11:00 - 11:20 | **Belfast Retrofit Hub Update**<br>Brenda Roddy (Belfast City Council) |
| 11:20 - 11:40 | **David McNeil – Choice Housing Ireland**<br>Deep Retrofit |
| 11:40 - 12:00 | **Session 1 Q&A**<br>All Session 1 Speakers |

# Agenda – Session 2

| | |
|---|---|
| 12:00 - 13:00 | **Lunch** |
| 13:00 - 13:20 | **SAP 10 / New Build**<br>Guy Fowler (Elmhurst Energy) |
| 13:20 - 13:40 | **RdSAP 10 Update**<br>Malcolm Mooney (Elmhurst Energy) |
| 13:40 - 14:00 | **Session 2 Q&A**<br>All Session 2 Speakers |

# Agenda – Session 3

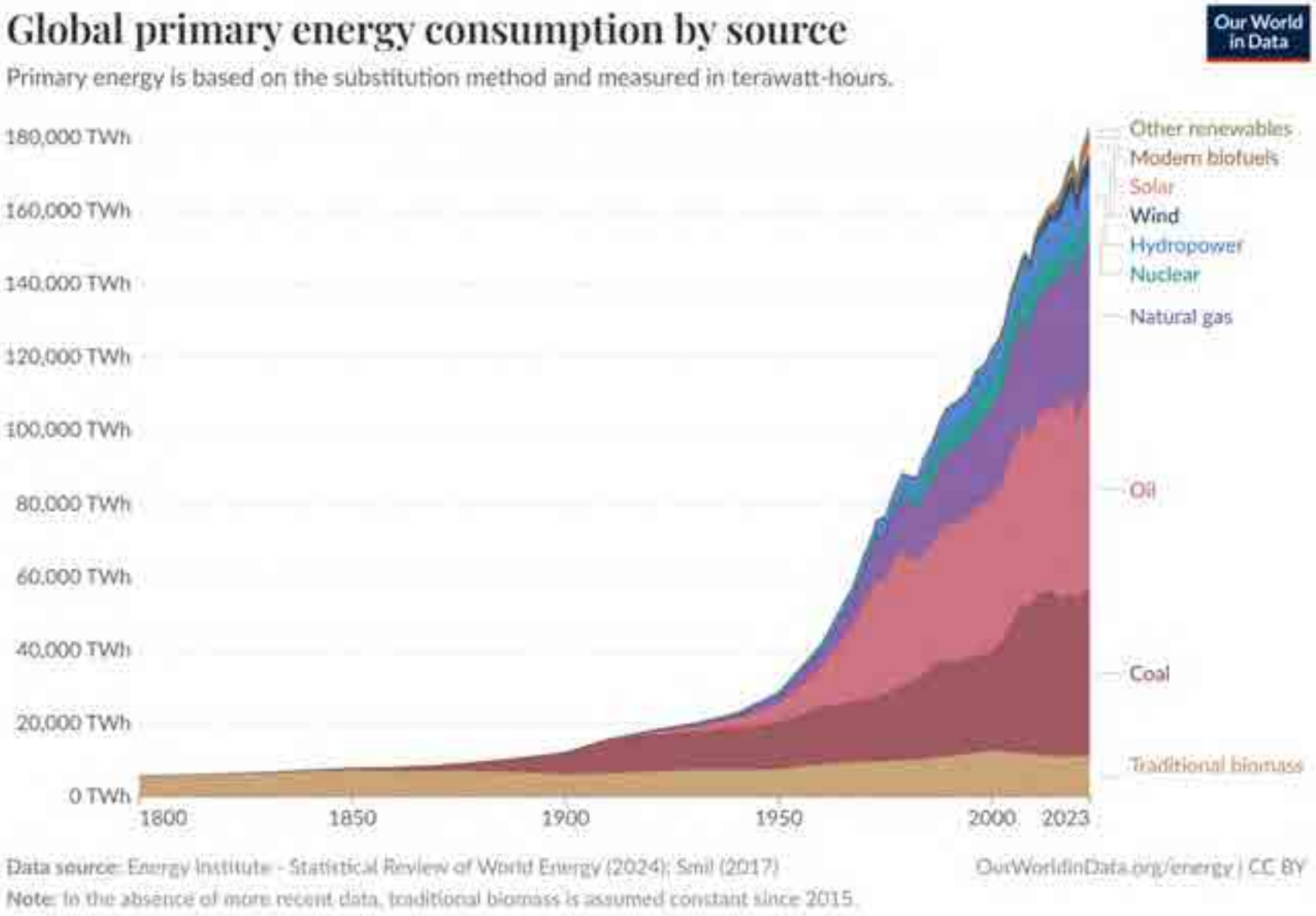
| | |
|---|---|
| 14:00 - 14:20 | **Afternoon Break** |
| 14:20 - 14:40 | **Airtightness Testing in Homes**<br>Guy Fowler (Elmhurst Energy) |
| 14:40 - 15:00 | **Energy Assessors in the Public Eye**<br>Sam Cantle (Elmhurst Energy) |
| 15:00 - 15:10 | **Session 3 Q&A**<br>All Session 3 Speakers |
| 15:10 - 15:20 | **Conference Close & Thank You**<br>Alistair Galloway (Elmhurst Energy) |

# Why a sustainable energy future might be a low energy and not just a low carbon one

John Barry, Queen's University Belfast




WE NEED RADICAL CHANGE 'EVERYTHING, EVERYWHERE, ALL AT ONCE'
GREENWASHING 'BUSINESS AS USUAL'

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An energy *addition*, rather than a transition

Renewable energy is not replacing or displacing carbon energy

# Reasons for ‘carbon lock in’ – path dependency

- Existing technologies, institutions, and behavioural norms together act to constrain the rate and magnitude of carbon emissions reductions in the coming decades.
- The inertia of carbon emissions due to such mutually reinforcing physical, economic, and social constraints is referred to as ‘carbon lock-in’.
- Carbon lock - a special case of ‘path dependency’ which is common in the evolution of complex systems
- Past decisions, investments, practices become self-reinforcing
- Thus, constraining and possibly excluding the prospects for alternatives to emerge
- Specifically, carbon lock-in refers to the dynamic whereby prior decisions relating to GHG-emitting technologies, infrastructure, practices, and their supporting networks constrain future paths, making it more challenging, even impossible, to subsequently pursue more optimal paths toward low-carbon objectives

# Reasons for Carbon Lock In

1. The 'structural addiction' or 'dependence' of so many modern systems (food, housing, transport, urban infrastructure etc.) on the carbon energy system
2. The power of carbon actors – fossil fuel companies for example*
3. Continuation of carbon energy system based on technologically decoupling carbon emissions from fossil fuels
4. The profitability of carbon – it makes conventional economic sense to continue burning carbon – increasing, positive or steady returns*
5. social support/cultural familiarity – normalisation of carbon system
6. culture and identities as well as interests tied up with carbon
7. state subsidies for fossil fuels



# Structural dependence on/addiction to fossil fuels

Can you name one thing in this room that has not been made in whole or part, or transported here in whole or part without the use of fossil fuels?

Modern economies are structurally/functionally dependent upon fossil fuels - example of pension funds



Reuters

# Exxon rebuts proxy advisor, says net zero emissions scenario 'unlikely'

By Sabrina Valle

HOUSTON, May 18 (Reuters) - Exxon Mobil Corp (XOM.N) has pushed back against investors pressing the largest U.S. oil producer to report on the risks to its business from restrictions on greenhouse gas emissions and potential environmental disasters.

In a reply on Wednesday to proxy advisor Glass Lewis, Exxon said the prospect of the world achieving net zero carbon dioxide emissions by 2050 is remote and should not be further evaluated in its financial statements.

Exxon has said the world is not on a path to achieve net-zero emissions in 2050. It says limiting energy production to levels below consumption demand would lead to a spike in energy prices, as observed in Europe following oil sanctions against Russia over Ukraine.

"It is clear that the IEA NZE does not, by the scenario authors' own assessment, meet the level of likelihood required to be considered in our financial statements," Exxon said in a response filed with the U.S. Securities and Exchange Commission.

"It is highly unlikely that society would accept the degradation in global standard of living required to permanently achieve a scenario like the IEA NZE," Exxon said in dismissing the proposal.

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We can't stop climate change

The energy transition is too costly

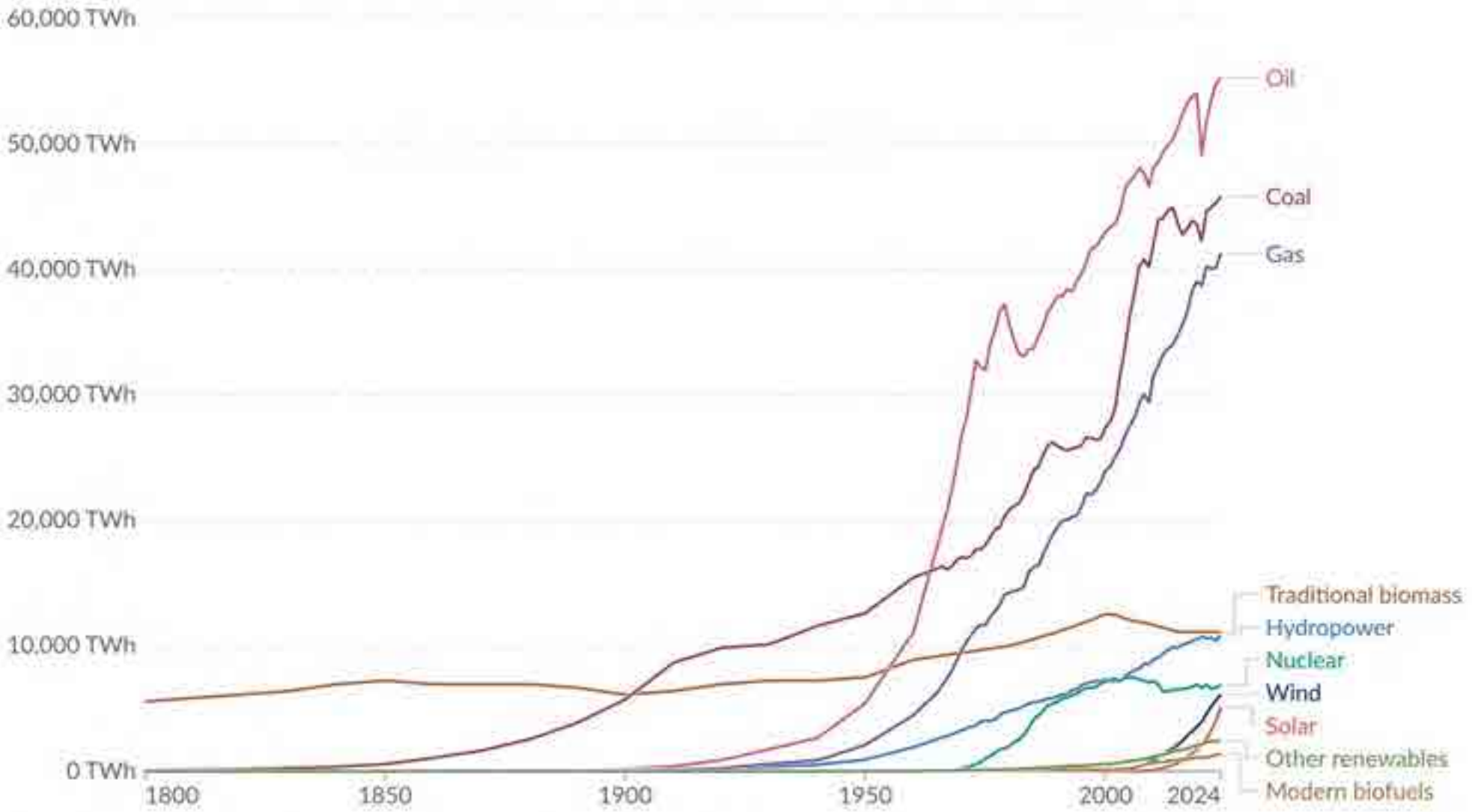
Profits more important than science

A post-carbon world is a poor world

# Global primary energy consumption by source

Our World in Data

Primary energy consumption is measured in terawatt-hours, using the substitution method.




**Data source:** Energy Institute - Statistical Review of World Energy (2025); Smil (2017)

OurWorldinData.org/energy | CC BY

**Note:** In the absence of more recent data, traditional biomass is assumed constant since 2015.

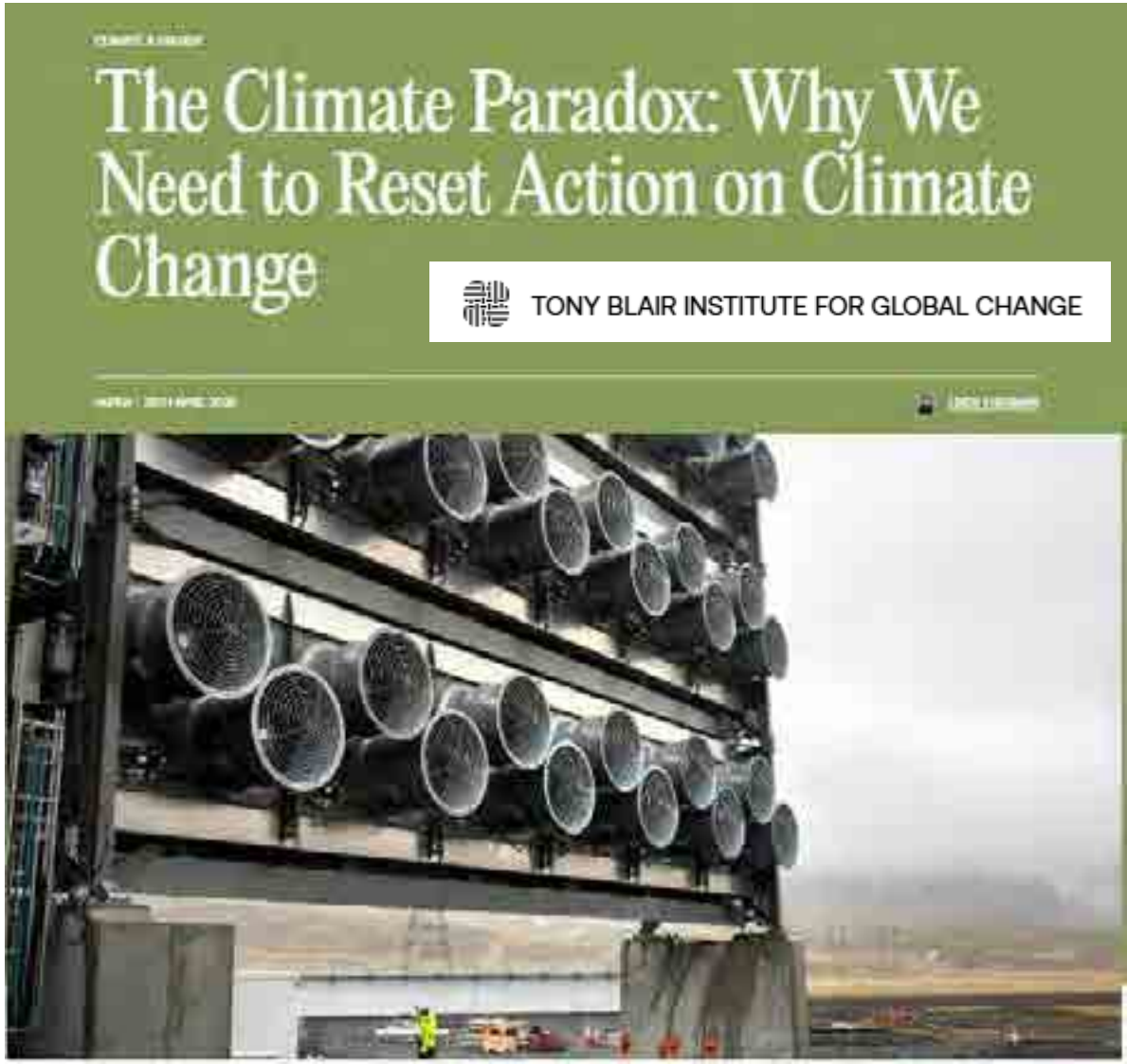
Mail Online

# Tony Blair says Net Zero push has become 'irrational' and 'hysterical' and warns critics of green energy costs must not be dismissed as 'climate deniers'

By DAVID WILCOCK, DEPUTY POLITICAL EDITOR FOR MAILONLINE
PUBLISHED: 09:23, 29 April 2025 | UPDATED: 09:50, 29 April 2025

"there's a new coalition to build; one that unites disillusioned activists with technologists and policymakers ready to act".

"*We should put carbon capture – directly removing carbon as well as capturing it at source – at the centre of the battle*. At present, carbon capture is not commercially viable despite being technologically feasible – but policy, finance and innovation would change this. *The disdain for this technology in favour of the purist solution of stopping fossil-fuel production is totally misguided* ".




**So now I'm woke AND misguided**

# Cop28 president says there is 'no science' behind demands for phase-out of fossil fuels

The Guardian UK

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## Exclusive: UAE's Sultan Al Jaber says phase-out of coal, oil and gas would take world 'back into caves'

Cop28 live - latest updates

Damian Carrington and Ben Stockton

Sun 3 Dec 2023 10.33 GMT



Sultan Al Jaber: 'There is no science out there that says that the phase-out of fossil fuel is what's going to achieve 1.5C.' Photograph: Anadolu/Getty Images

"There is no science out there, or no scenario out there, that says that the phase-out of fossil fuel is what's going to achieve 1.5C.

Please help me, show me the roadmap for a phase-out of fossil fuel that will allow for sustainable socioeconomic development,

*unless you want to take the world back into caves*".

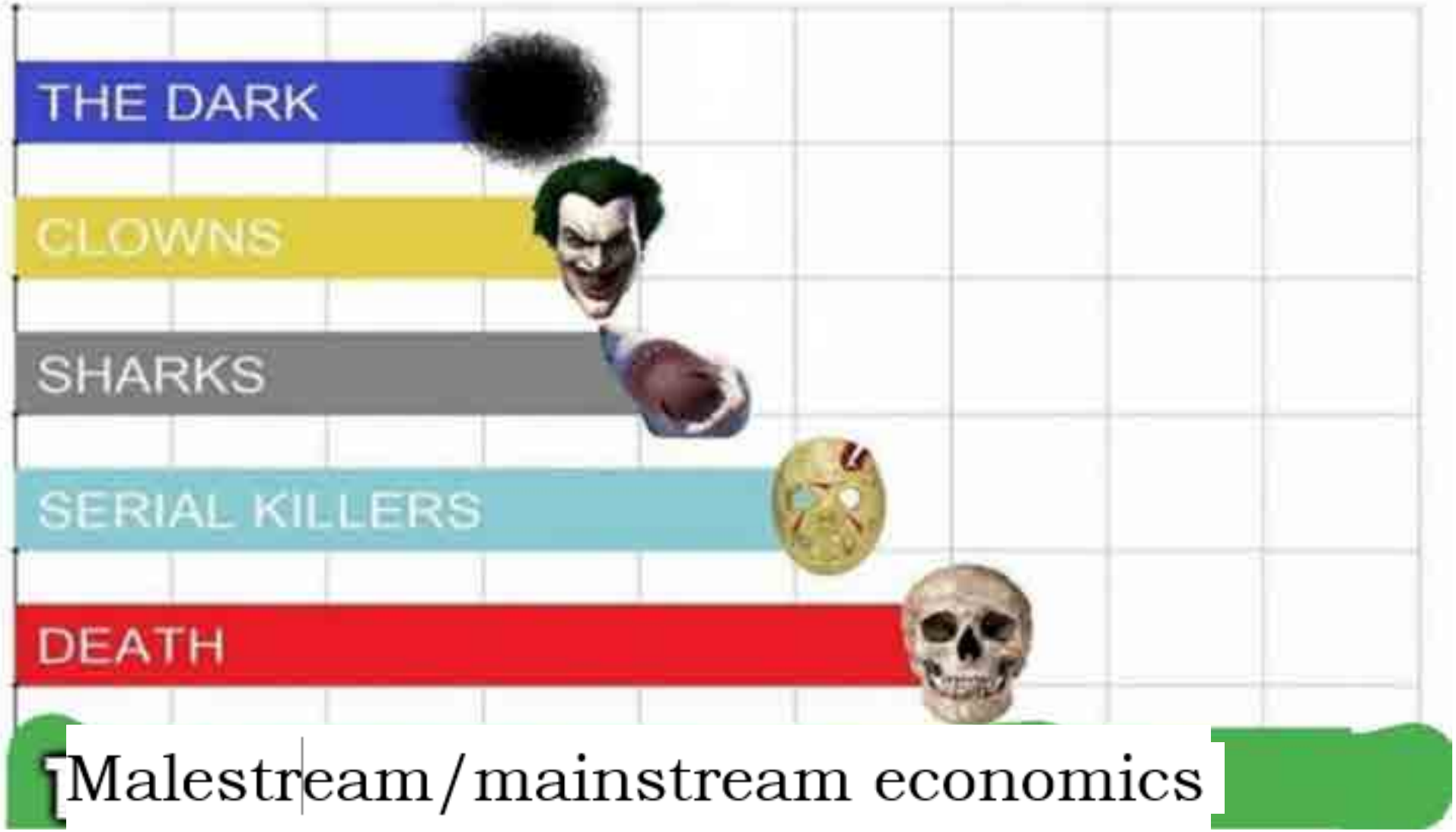
Tony Blair PM

An anagram of

I am Tory Plan B



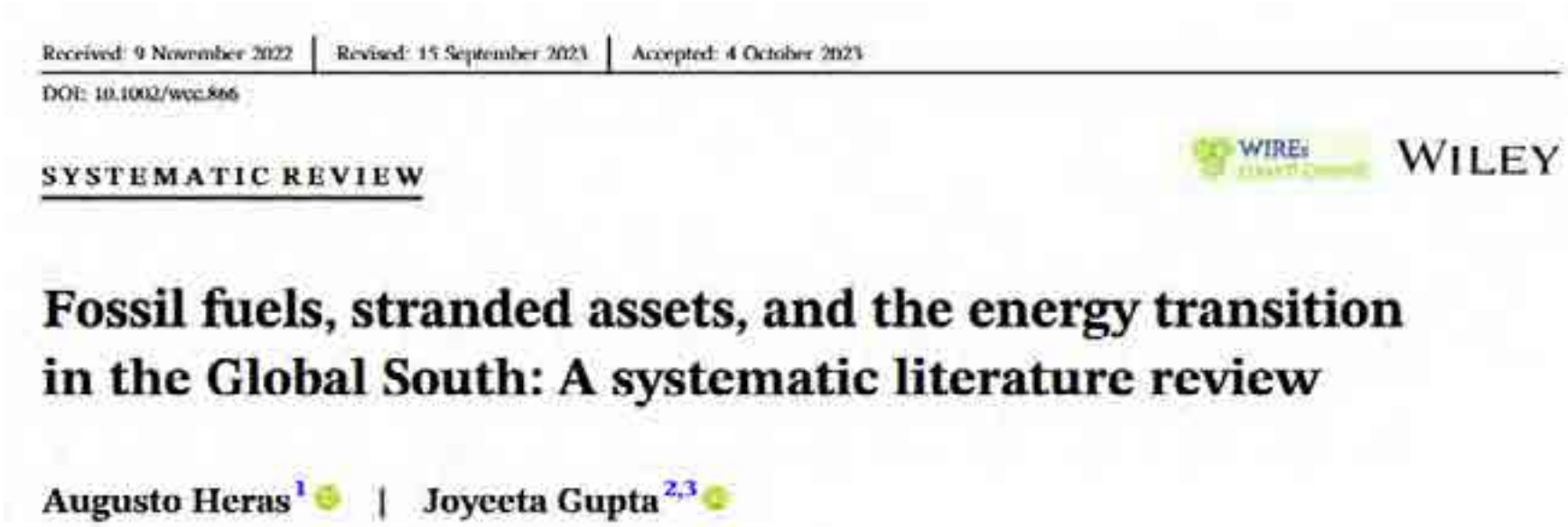
# The Scariest Things on Earth



# Renewable energy is adding to NOT replacing fossil fuels

"a gradual increase in renewable energy sources (RES) share ***is inadequate*** for a pervasive change in energy systems"

(Heras and Gupta, 2023: 8; emphasis added)



Received: 9 November 2022 | Revised: 15 September 2023 | Accepted: 4 October 2023

DOI: 10.1002/wcc.866

SYSTEMATIC REVIEW

WIREs WILEY

**Fossil fuels, stranded assets, and the energy transition in the Global South: A systematic literature review**

**Augusto Heras**[1] | **Joyeeta Gupta**[2,3]

# Renewable energy remains cheapest power builds as new gas plants get pricier

By Reuters

June 16, 2025 9:53 PM GMT+1 · Updated June 16, 2025



NEW YORK, June 16 (Reuters) - Renewable power like solar and onshore wind is the least expensive and quickest power generation source to deploy in the United States, even without government subsidies, Lazard said in a report on Monday.

The cost to build new gas-fired power plants, meanwhile, has hit a 10-year high amidst the country's record electricity use and growing backlogs for turbines and other equipment needed to construct the plants, Lazard, a global financial services firm, said in its annual Levelized Cost of Energy+ analysis.




# Its not the price of renewables that matters **but profits…**

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What if the problem is not that transitioning to renewables is too expensive, but that saving the planet is not sufficiently profitable?

Mistake by policymakers, academics, commentators, and the general public to privilege a focus on prices over profits when making predictions about the green transition.

Just because RE is decreasing in price does not mean it is as profitable for investors/owners of capital as fossil fuels

And can and was/is used to just removing tax credits or subsidies to the RE sector (while allowing the explicitly and implicit subsidies to fossil fuels to continue

The returns on renewable /green energy investments are too low

It isn't just relative power prices that determine how many wind or solar parks get built; more important is how profitable entrepreneurs think these investments will be.

One reason is the "unbundled" electricity markets that governments have introduced round the world. These divide the market between generation, distribution and retail, permitting competition to take place at some points in the chain — especially generation.

Yet this very process throws up prices that are too volatile to support the upfront capital investment that renewable generators (or, rather, their lenders) require.

# Limits of Market/Capitalist Energy Transition

May 2019, data released by the International Energy Agency showed renewable energy deployments stagnating for the first time since the turn of the century.

Capital is too concerned with profit to respond to the climate crisis with the necessary alacrity.

The dominance of using the Levelised Cost of Electricity (LCOE) - average cost of a unit of electricity produced by different methods – is not neutral but associated with the neoliberalism of the 1990s/2000s.

Problem is that for renewables, 80%-plus of LCOE is upfront capital investment – and the fate of many renewables projects hinges on whether banks and other financial institutions are prepared to lend money to cover that cost. And on the rates at which they are prepared to lend.

A (solely) market/price-based energy transition/decarbonisation strategy will not work…

# Carbon energy more profitable than renewable energy

The internal rates of return (IRR) of carbon projects are ‘around 15 to 20 per cent, or higher’

… whereas ‘typical IRRs on renewables today are around 5 to 6 per cent’.

Role here for state not private investment ?

‘Patient capital’ of the state – nationalised decarbonisation of the energy system

Perhaps… but most governments not moving in this direction but rather seeking to ‘de-risk’ investment for the private sector and put in place policies to attract private investment

# A Sustainable Future – A Low Energy not just A Low Carbon One?

Framing the energy transition not as the replacement of the same or more carbon energy with renewable energy

But as a transition to *a low energy future*

So, prioritising energy reduction, efficiency and conservation over renewable energy production

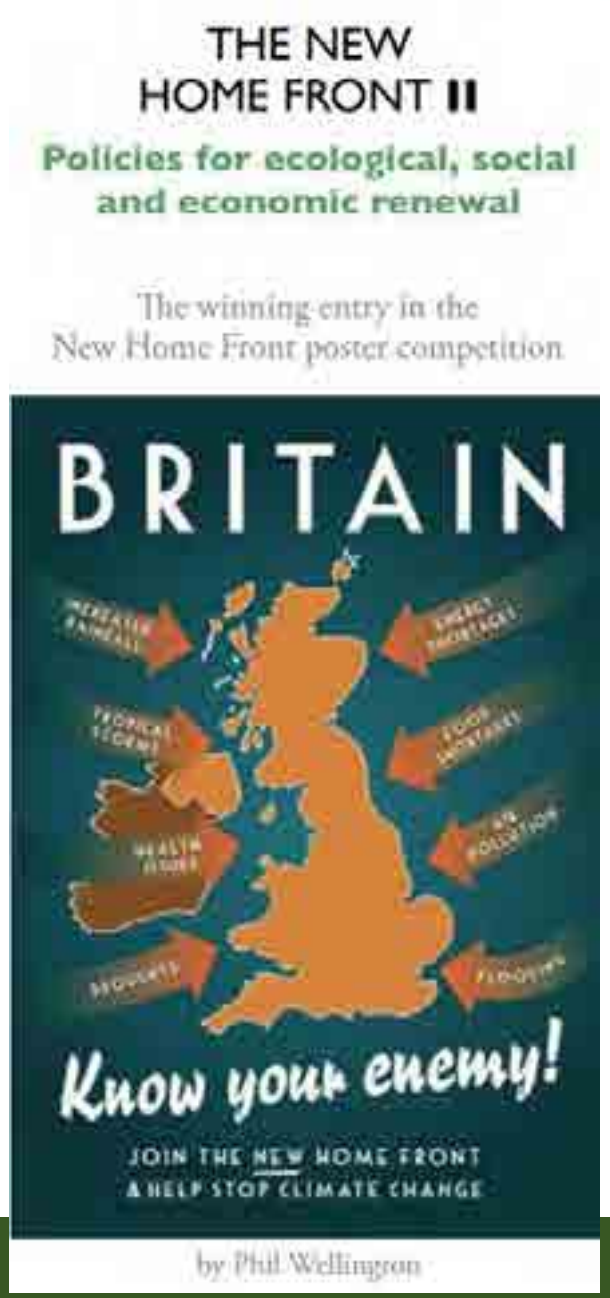
And a focus on innovation to 'decouple' high standards of living from high energy use (from whatever source)

The cheapest and most sustainable and climate positive form of energy is the energy you do not use

Can increase public support for the energy transition and overcome ‘carbon lock-in’?

Framing a low carbon future as also a lower energy one but with same/high standards of living ?

HEINRICH BÖLL STIFTUNG
BRUSSELS
European Union




**Energy efficiency is the best choice for Europe's energy sovereignty!**

**Commentary** The inability to adequately sanction the criminal invasion of Ukraine by Russian President Putin painfully demonstrates Europe's massive dependencies from fossil fuel imports. Phasing out fossil fuels is no longer "just" about fighting the climate crisis with its devastating consequences for all livelihood on earth. The fossil price crisis of the last year already showed that the transition to renewable energy is also a precondition for Europe's energy sovereignty and price stability. Putin's invasion of Ukraine builds on the already known vulnerabilities of dependency, underscoring geopolitical instability and posing a serious threat to security and peace.

by Jutta Paulus
4 April 2022





WHY IS IT EASIER TO IMAGINE THE END O THE WORLD



... THAN THE END OF CAPITALISM?

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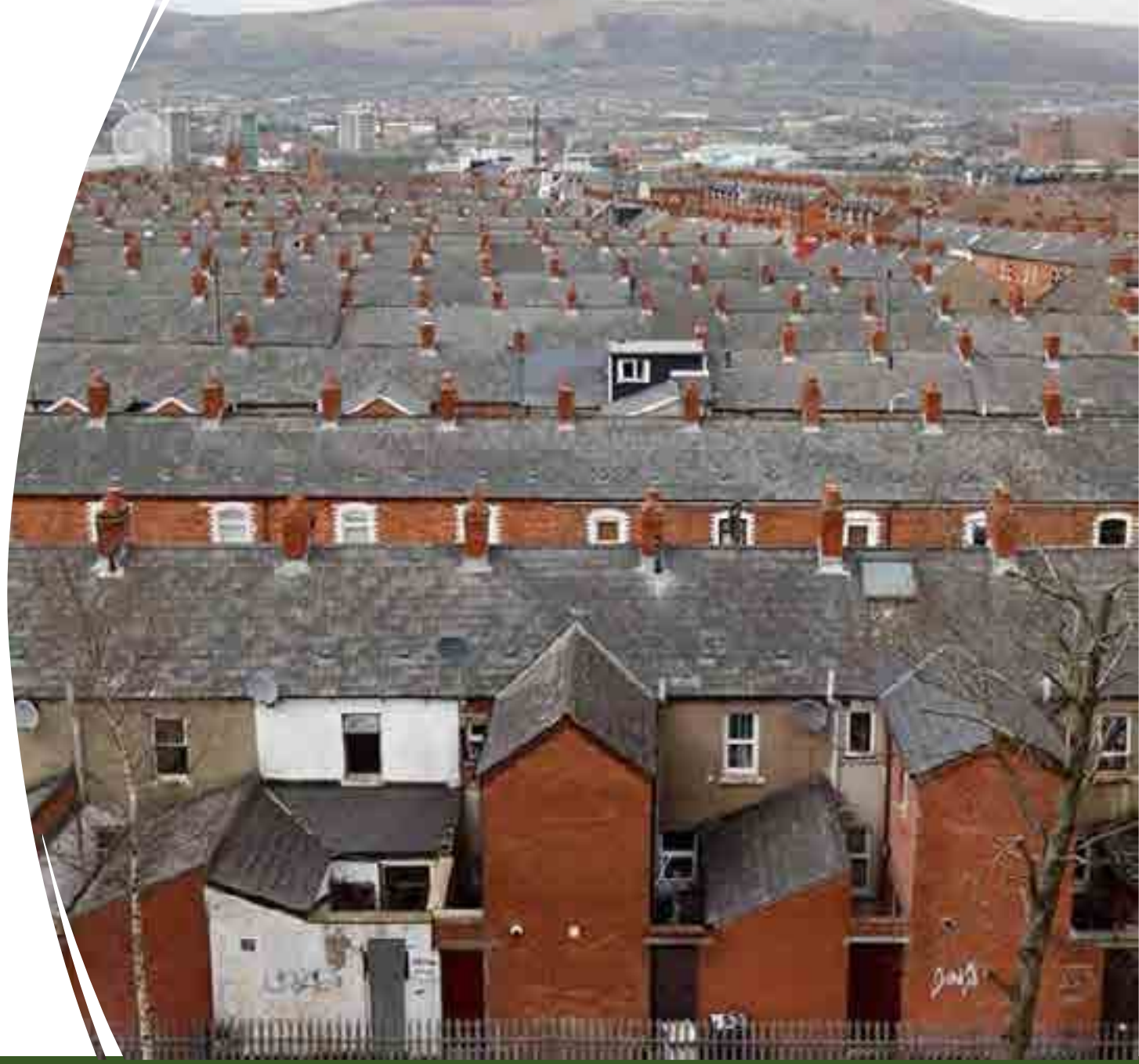
# Belfast Retrofit Hub Update

Brenda Roddy, Belfast City Council



# Belfast Retrofit Hub –

1. Who/what are we?
2. What's our remit?
3. What do we do?
4. Hub led projects
5. Partner projects



# Belfast Retrofit Hub –

## Who/what are we?

1



# Belfast Retrofit Hub

## What's our remit?

2

**Belfast's carbon footprint**
2020
**1674 Kt CO2e**




**Residential**

**Public & commercial**

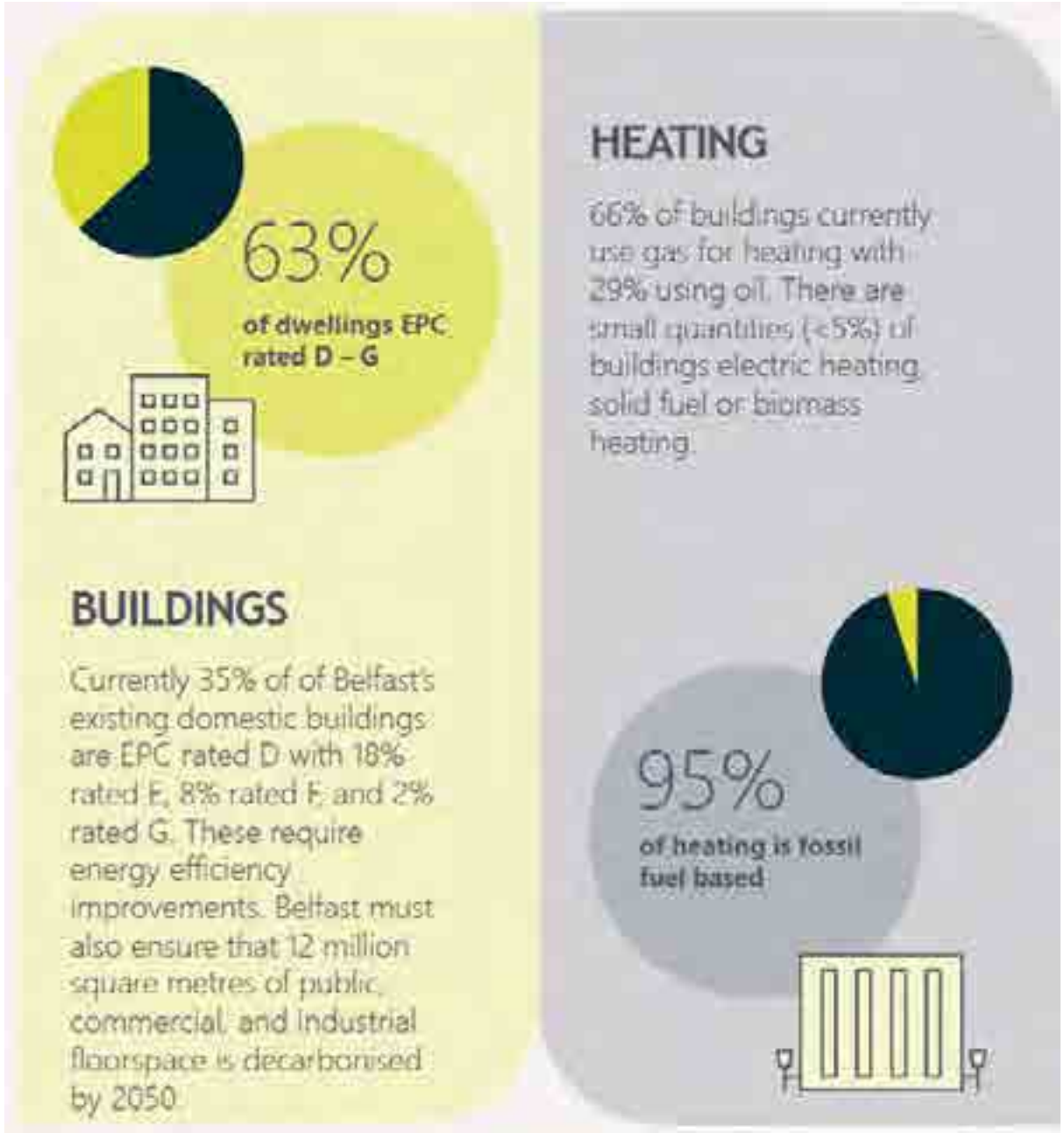
**Industry**

**Transport**

# Belfast Retrofit Hub

## What's our remit?

3

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# Belfast Retrofit Hub

## What's our remit?

# 4



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Belfast Telegraph

belfasttelegraph.co.uk

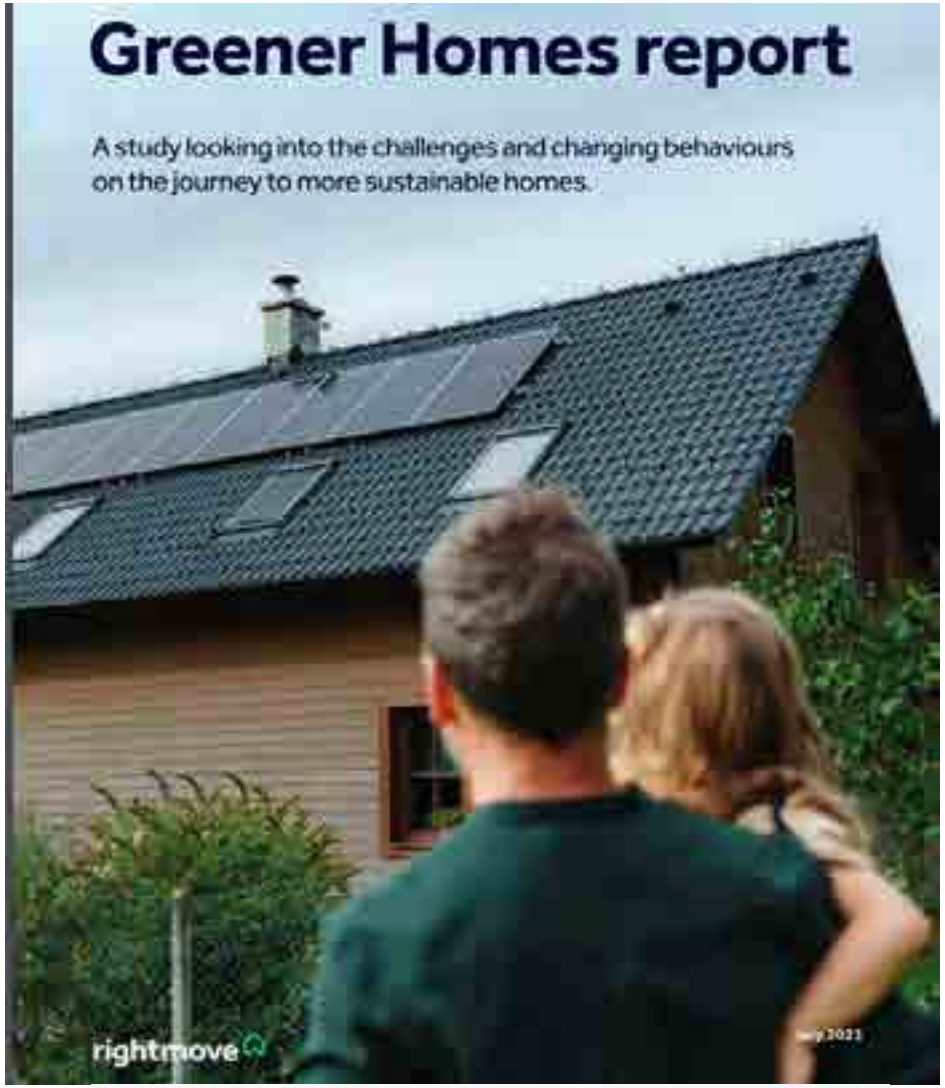
Home / Business / Northern Ireland / Commercial Property

### Three quarters of Belfast offices 'unusable by 2030' – CBRE

# Belfast Retrofit Hub

## What's our remit?

5




rightmove

# Belfast Retrofit Hub

Our priorities?

6

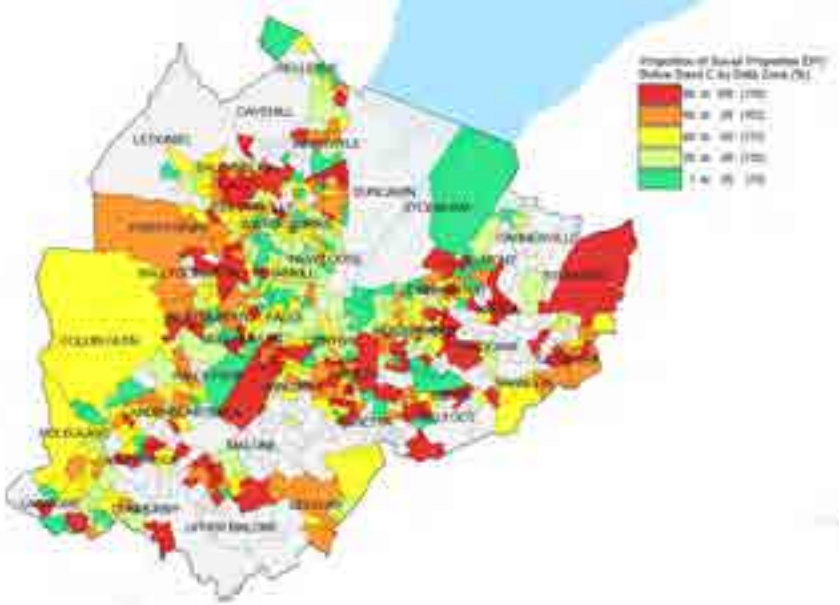
- Build the community
- Build the evidence base of what works
- Develop funding-ready plans
- Catalyse and collaborate
- Build in resilience

# Belfast Retrofit Hub

## What are we working on?

## Retrofit Pilot Project

# 7









# Belfast Retrofit Hub

## What are we working on?

## Private rental survey

# 8




C60








# Belfast Retrofit Hub

## Partner projects

## NIFHA FTC bid

# 9



# Belfast Retrofit Hub

## Partner projects

## Advice NI SECs

# 10

SUSTAINABLE ENERGY COMMUNITIES NI

# Get in touch

roddybrenda@belfastcity.gov.uk



# Deep Retrofit, Finaghy

David McNeil, Choice Housing



# Choice - Strategy and Direction

- Choice have 13,000+ homes with 30,000+ tenants and residents
- We are a social enterprise, with all surpluses reinvested to fulfil our charitable purpose '*to benefit the community*'
- We develop around 400+ homes a year
- Drivers include SDGs, Housing Need, Fuel Poverty etc.
- We have invested in a Sustainability & Energy Team, who:
  - Manage energy procurement and contracts (£2m+ spend)
  - Manage our solar PV portfolio (700+ systems)
  - Advise on new developments and retrofit
  - Manage provision of EPCs
  - Consider biodiversity improvements
  - Engage with tenants and stakeholders



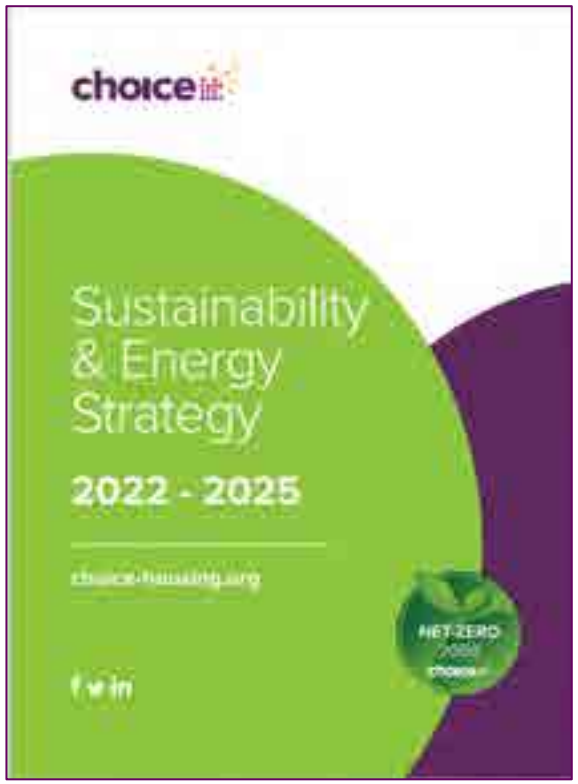




# Some achievements (2022-2025)

- Reduced scope 1 & 2 emissions by c21% (from 2020/21)
- Invested over £5m in energy efficiency & carbon reduction
- Invested over £250k in innovative technologies and processes
- New gas and electricity contracts
- Average EPC EE rating of 76.95 (Band C)
- 87.35% of EPCs Band A-C
- EPC data for c97% of our homes (c2% estimated)
- Over 1,500MWh of electricity generated over 3 years from PV systems
- All new homes SAP A or B
- Completed deep retrofit trial – 2 homes to EPC Band A
- Completed Landlord Solar PV and battery trial



# Sustainability & Energy Strategy (2025-2028)

Focusing on 11 areas:

- Build Sustainable Homes
- Improve our Existing Housing Stock
- Invest in Renewable Energy
- Reduce emissions & energy consumption
- Adapt to climate change
- Protect & enhance biodiversity (inc Biodiversity Action Plan)
- Effectively manage our resources
- Tenant & staff engagement
- Promote sustainable transport options
- Manage water use
- Equip ourselves for the journey ahead!





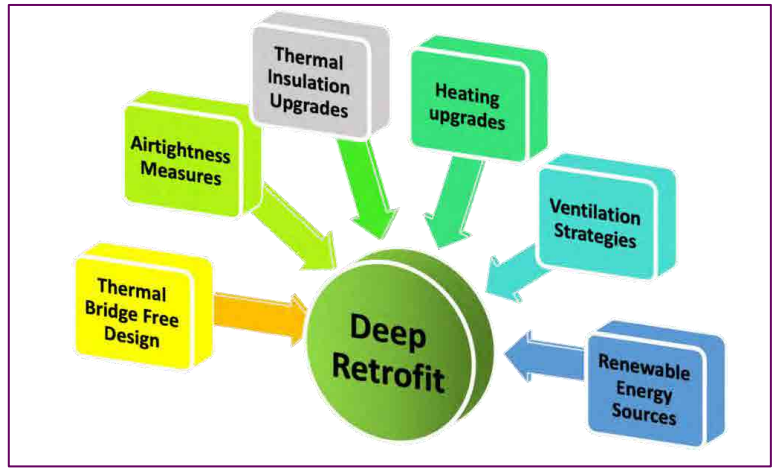






# Deep Retrofit at Finaghy

- 301 Victoria Housing Estates (VHE) Ltd properties transferred in 2020
- Substantial renovation and refurbishment programme
- Multiple phases, with works including fabric and heating upgrades
- Total cost of improvement works c£16.5m
- An opportunity was identified to deep retrofit 2 homes.
- This aligned with our strategy and helps to provide info on costs and benefits.
- PAS2035 processes were followed where possible.

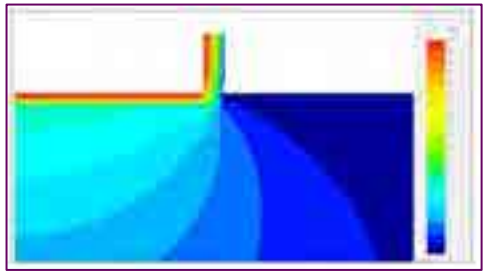




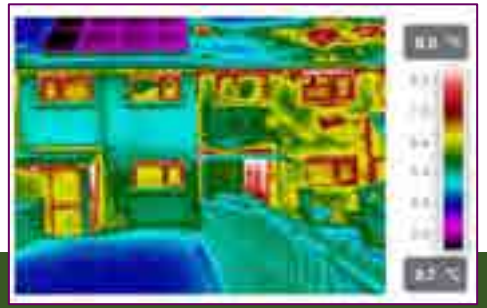

# Retrofit Specification (example)

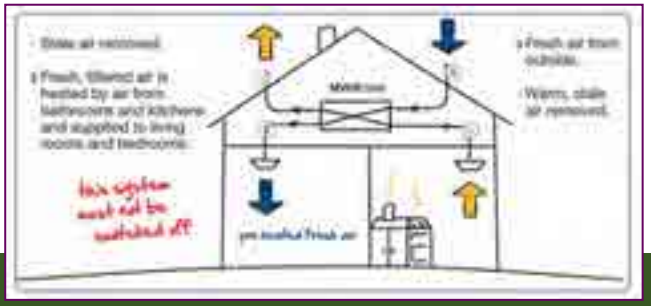


- Walls – U-Value from 0.46W/m2k to 0.16W/m2k
- Floor - U-value from 0.67 W/m2k to 0.09 W/m2K
- Roof : U-value from 0.43 W/m2K to 0.11 W/m2K
- Windows : U-Value of 0.80 W/m2K
- Doors : U-Value of 1.0 W/m2K (averages)
- Air Permeability improved
- Thermal Bridging Analysis (PSI) and modelled improvement.
- Heating system – oil to natural gas, improved controls, FGHR, low temp design and weather compensation.
- Ventilation systems.
- Solar PV – 3.52kWp.









# Shallower retrofit – end terrace

















# Deep retrofit – mid terrace









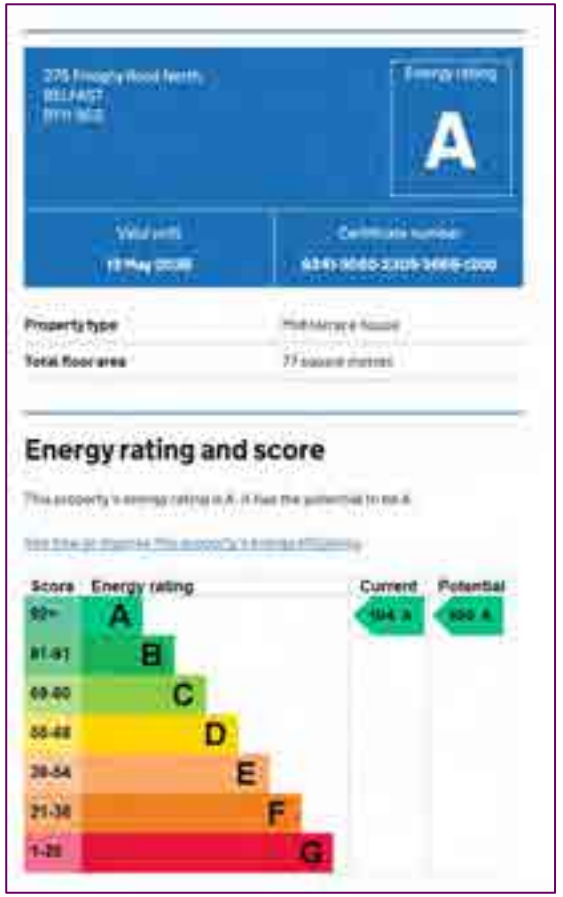

# Finished Homes











# Monitoring

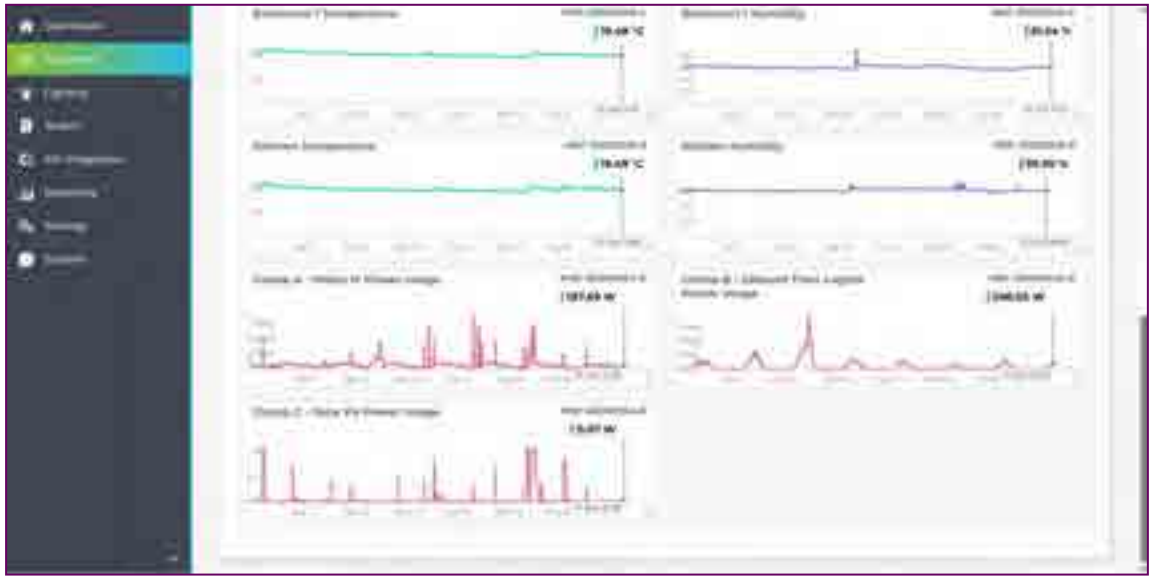
- Monitoring is in place, but will be 2026 before 12mth data available

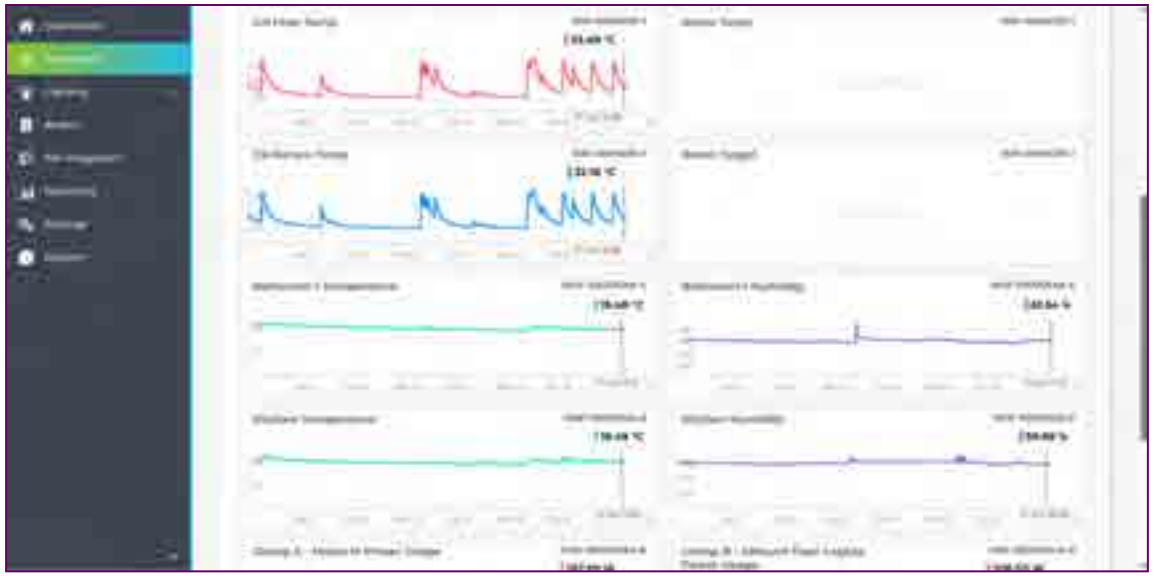












# Challenges and Lessons Learned

- Delivery via existing contractor and consultant - 'on the job learning' in terms of PAS2035.
- Limited experience of 'deep' retrofit in NI and limited PAS2035 assessors - specific roles may be split.
- Difficult to progress deep retrofit due to the need to decant, and tenant refusals. Decanting also means lost rent for a landlord.
- Some processes can take a long time e.g. planning permission for EWI - In particular the options for brick slips to match the existing façade – available product options.
- Attention to detail required e.g. air tightness (e.g. membranes) and MVHR systems and ductwork etc.
- No funding for deep retrofit for the sector and progressing work at scale cannot be funded through existing rent levels.
- Increasing rent levels to fund works would not align with a just transition to net zero.
- Future maintenance and replacement costs need to be considered, particularly with technologies e.g. ASHP, PV and MVHR.





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# Thank you!

energy@choice-housing.org



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# Q&A Session



# Lunch Break

Our next speaker will be at: 13:00pm

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# SAP 10 & HEM

Guy Fowler, Elmhurst Energy



# SAP10/HEM & New Regulations

- **Changes to SAP 10 & Compliance.**
- **New Notional Dwelling.**
- **Compliance reports and Photographs.**
- **Introducing HEM**
- **Why replace SAP?**
- **HEM Tool**
- **Open Source and Calculation Times**
- **Factor Changes**
- **SAP 10.3**



# SAP10/HEM & New Regulations

- Currently within SAP 2009 compliance is based on carbon emissions; dwelling emissions rate (DER) vs target emissions rate (TER).

- However, this can result in unintended consequences…

- TB F1 & SAP 10 will use 2 further metrics to comply with;
  - **Primary Energy / DPER**
    - **Fabric Energy Efficiency / DFEE**
      - **Carbon Emissions / DER**




- All three metrics must achieve the target rates to achieve compliance.
- Ensures new homes have balanced energy efficiency standards.

# SAP10/HEM & New Regulations

- **Changes in SAP 10**

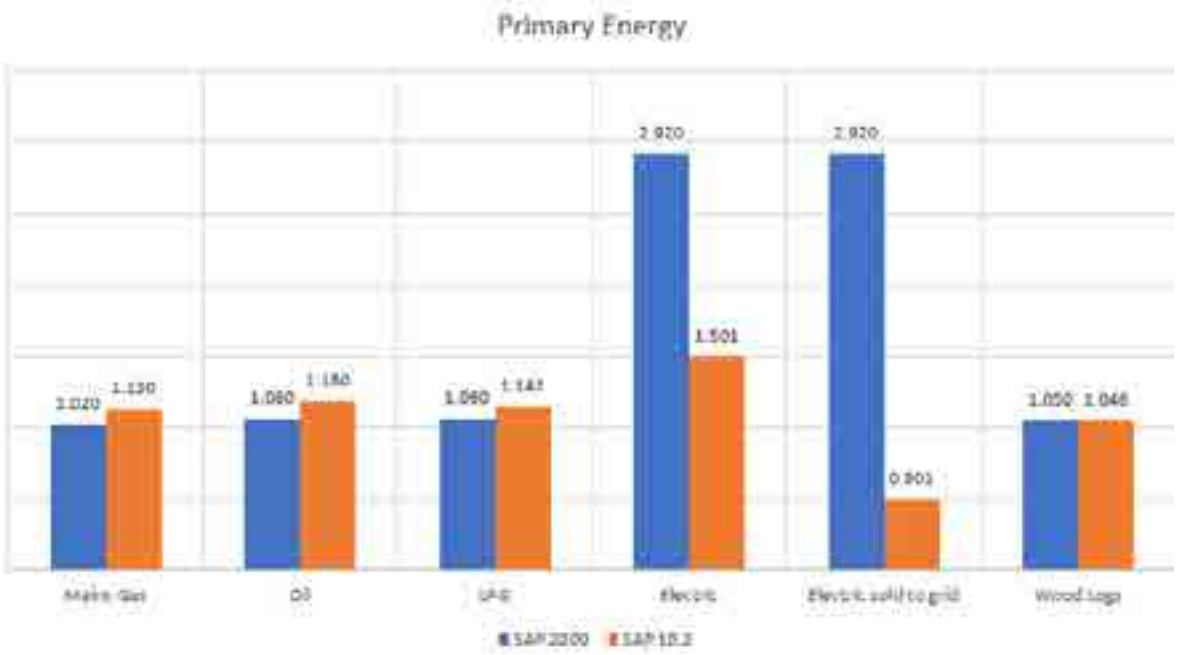
- Cost, Carbon and Primary Energy factors
  - Lighting calculation
    - Hot Water calculation
      - PV energy calculation
        - Battery storage & PV diverters
          - Thermal Bridging
            - Solar Hot Water
              - Heating Controls
                - Community heating



# SAP10 & New Regulations

- **Primary Energy Factors SAP 10.2**

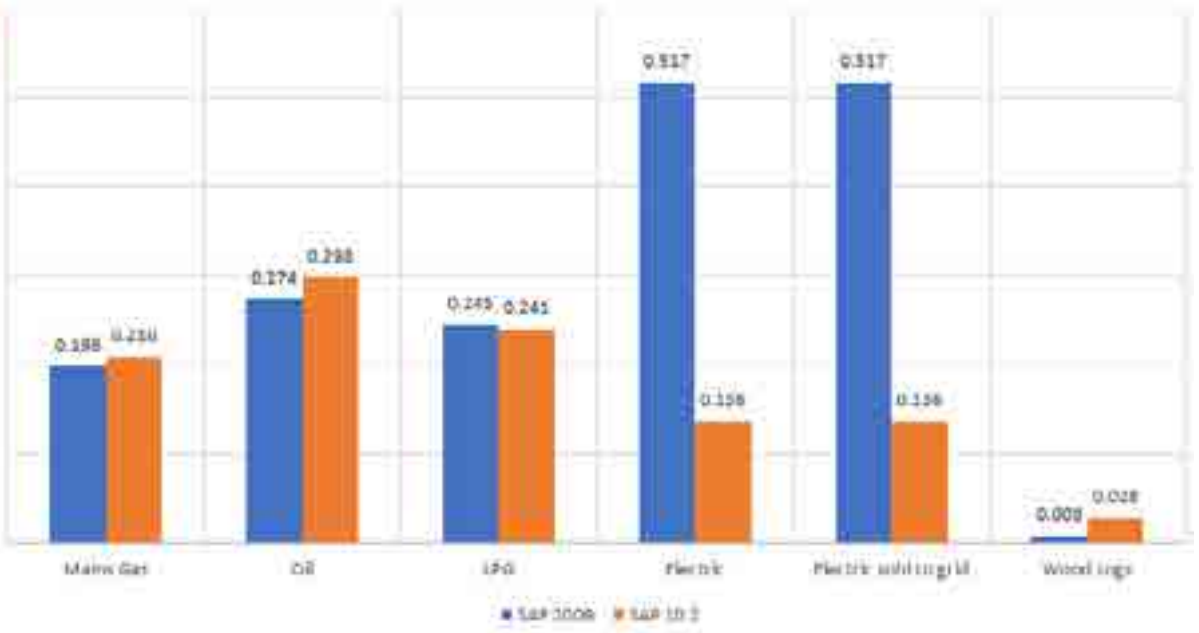
| Fuel | SAP 2009 | SAP 10 |
|---|---|---|
| Mains Gas | 1.020 | 1.13 (+11%) |
| Oil | 1.060 | 1.18 (+11%) |
| LPG | 1.060 | 1.141 (+8%) |
| Electricity | 2.920 | 1.501 (-49%) |
| Electric sold to grid | 2.920 | 0.501 (-83%) |
| Wood Logs | 1.050 | 1.046 (-0.4%) |



# SAP10 & New Regulations

- **Carbon Factors SAP 10.2**

| Fuel | SAP 2009 | SAP 10 |
|---|---|---|
| Mains Gas | 0.198 | 0.21 (+6%) |
| Oil | 0.274 | 0.298 (+9%) |
| LPG | 0.245 | 0.241 (-2%) |
| Electricity | 0.517 | 0.136 (-74%) |
| Electric sold to grid | 0.517 | 0.136 (-74%) |
| Wood Logs | 0.008 | 0.028 (+250%) |



# New Regulations

- **Notional Dwelling in TB F**

| | Typical TB F 2022 Spec | Proposed TB F 2025 |
|---|---|---|
| External Walls | 0.22 w/m²k | 0.18 w/m²k |
| Party Walls | 0 w/m²k | 0 w/m²k |
| Floors | 0.15 w/m²k | 0.13 w/m²k |
| Roofs | 0.12 w/m²k | 0.11 w/m²k |
| Solid Doors | 1.4 w/m²k | 1.0 w/m²k |
| Windows | 1.4 w/m²k | 1.2 w/m²k |
| Air Permeability | 5 m³/m²/hr @ 50Pa | 5 m³/m²/hr @ 50Pa |
| Thermal Bridging | y-0.06 w/m²k | y-0.05 w/m²k |
| Ventilation | Natural with intermittent fans | Natural with intermittent fans |

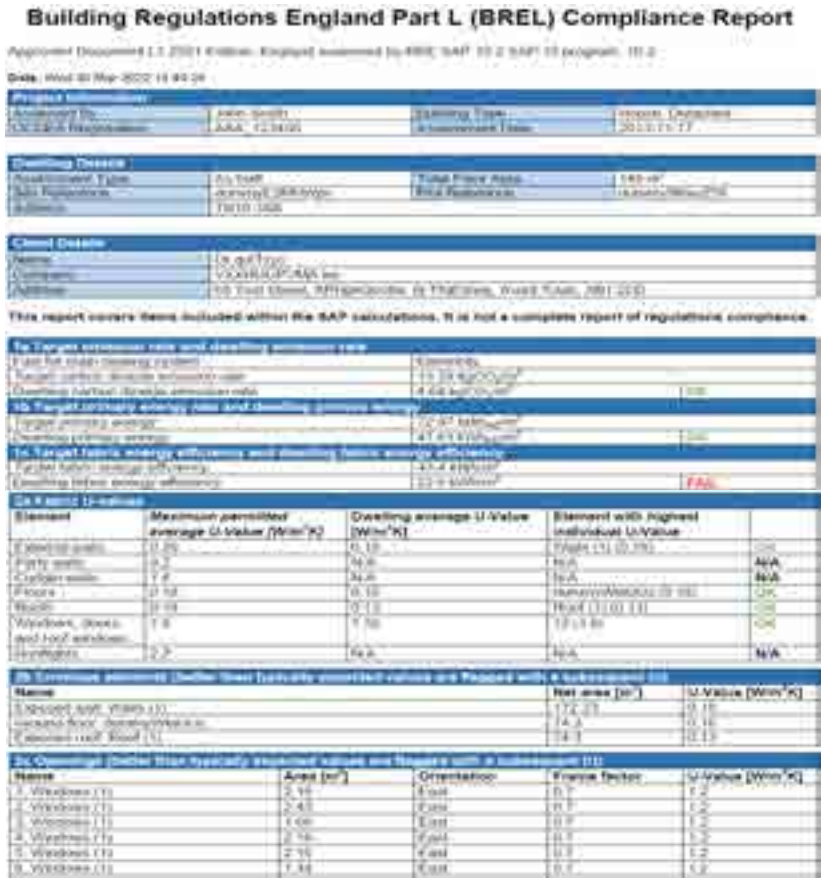
# New Regulations

- **Notional Dwelling in TB F**

| | Typical TB F 2022 Spec | Proposed TB F 2025 | |
|---|---|---|---|
| | | Option 1 | Option 2 |
| Space + Water Heating | Mains gas boiler, 89.5%, radiators | Mains gas boiler, 89.5%, radiators, flow temp. 55°C | ASHP, 295%, radiators, flow temp. 45°C |
| Controls | Time and Temp. zone control, delayed stat, weather compensator | Time and Temp. zone control, ErP Class V Compensator, delayed stat | Time and Temp. zone control, TRVs, weather compensator |
| WWHRS | None | Instantaneous WWHRS, connected to all showers | None |
| PV | 1.51 kWp | kWp = 40% of ground floor area / 6.5 | None |

# SAP10 & HEM / New Regulations

- **Compliance reports and Photographic evidence.**
  - A domestic version of the BRUKL report used in non-dom, called Building Regulations England Part L (BREL) report has been created.
  - Similar to compliance report, but more detailed in some areas.
  - Part L 2021 saw the introduction of photographic evidence requirements.
  - Photos needed for various areas of fabric and services.
  - To be sent to the OCDEA and Building Control Body.
  - Proposed to create a Northern Ireland version of BREL and introduce photographic evidence.


Building Regulations England Part L (BREL) Compliance Report

# SAP10 & HEM / New Regulations

- **Introducing HEM.**
  - Replacement for SAP.
  - Previously known as “SAP 11”.
  - Created by BRE.
  - A complete rebuild of the methodology.
  - To be first used in FHS from 2025.
  - Will eventually be used for calculation of EPCs for new and existing homes.



# SAP10 & HEM / New Regulations

- **Why Replace SAP**
  - SAP has been used since 2002 for demonstrating compliance with Part L.
  - *"The government recognises that there are longstanding issues with SAP, which are not conducive to the delivery of our housing and climate change objectives."*
  - SAP is very simple compared to the modern industry standards.
  - SAP is limited in its ability to model modern dwellings and technologies.
  - Many industry bodies have recommended updating SAP such as the Climate Change Committee (CCC), SAP Industry Forum and 2023 Mission Zero Review.




**Design SAP 2005**
**Design SAP 2009**
**Design SAP 2012**
**Design SAP 10**

# SAP10 & HEM / New Regulations

- **HEM / FHS Consultation Tool**
  - Free tool created by BRE to show HEM when used for FHS.
  - Basic user interface, long winded data entry.
  - Users should be wary about drawing too many conclusions in regard to specification for future.
  - Some technologies not yet available for use.
  - No PCDB – a few ‘example’ systems are available.



**Version information**

**Current version is 0.5.36**

**Version 0.5.36 (Published on 26 January 2024 - Bug fixing):**
List of changes:
- Bugfix to ensure pitched roofs are included in calculation.
- Minor updates to validation rules and help text.
- Consultation Tool version number now displayed before running calculation.

**Version 0.5.35 (Published on 10 January 2024 - Bug fixing):**
List of changes:
- Bugfix to PV Diverters not working when multiple heat sources defined for a storage tank.

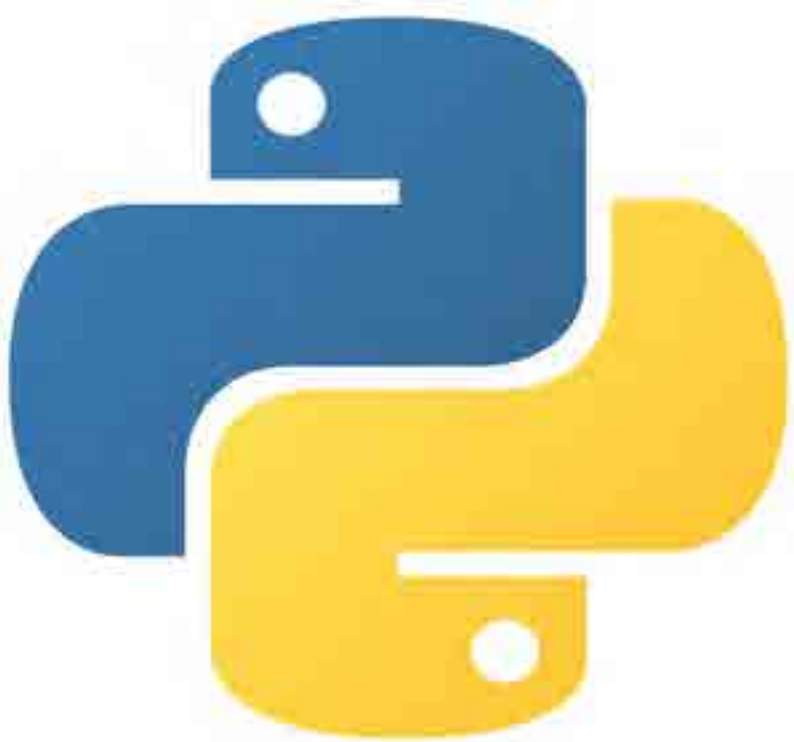
**Version 0.5.34 (Published on 03 January 2024 - Bug fixing):**
List of changes:
- Added some help text to better explain certain inputs for Ground elements.
- Bugfix to modelling of storage tank in calculation engine.
- Fixed error in Heat Emitter Input Estimator spreadsheet, and updated User Guide link.

**Version 0.5.33 (Published on 20 December 2023 - Bug fixing):**
List of changes:
- Fixed error in hot water only heat pump.
- Fixed error where some heat network inputs were not visible.
- Fixed error in Heat Emitter Input Estimator spreadsheet, and updated User Guide link.

**Version 0.5.32 (Published on 13 December 2023 - Major):**
List of changes:
- Candidate final release.

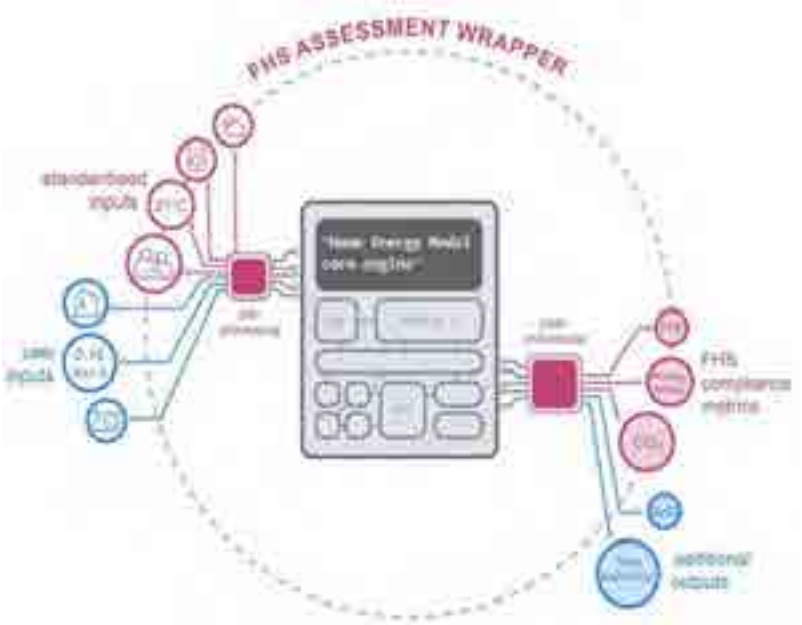
# SAP10 & HEM / New Regulations

- **Open-Source Methodology**
  - One aim for HEM was to increase the transparency of the methodology.
  - Government has published the code base of the HEM.
  - It will be developed in the open from now on.
  - Should improve transparency and allow peer review of the methodology.
  - This may remove the need for a specification document as used for SAP previously.
  - May result in more users of the HEM which will feed into the official versions used.



# SAP10 & HEM / New Regulations

- **Wrappers**
  - To distinguish between different purposes when using the HEM, ‘wrappers’ will be created.
  - A wrapper controls the user inputs, standardized inputs and outputs from the HEM for a specific purpose.
  - The only wrapper currently available is for assessing compliance to the Future Homes Standard.
  - Future wrappers may include EPC production, PAS 2035 assessments, existing dwelling assessments etc.



# SAP10 & HEM / New Regulations

- **Calculation Time**
  - SAP 10 calculates energy use on a monthly basis.
  - Improved over SAP 2012 but still struggles with new technologies, time of use tariffs etc.
  - HEM will calculate on 30-minute intervals.
  - Will ensure it is more suited to new innovations.
  - However, makes the calculation engine considerably more complex!



# SAP10 & HEM / New Regulations

- **Primary Energy Factors**

| Fuel | SAP 10.2 | HEM: FHS |
|---|---|---|
| Mains Gas | 1.130 | 1.120 |
| Oil | 1.180 | 1.136 |
| LPG | 1.141 | 1.104 |
| Electricity | 1.501 | 1.969 |
| Electric Generated On Site | 0.501 | 1.000 |
| Wood Logs | 1.040 | 1.046 |

**Carbon Factors**

| Fuel | SAP 10.2 | HEM: FHS |
|---|---|---|
| Mains Gas | 0.210 | 0.214 |
| Oil | 0.298 | 0.298 |
| LPG | 0.241 | 0.241 |
| Electricity | 0.136 | 0.086 |
| Electric Generated On Site | 0.136 | 0.000 |
| Wood Logs | 0.028 | 0.023 |

# SAP10 & HEM / New Regulations

- **HEM – Overview**
  - **HEM is a significant change**
    - New methodology, delivery model, data inputs and results generation
  - **Calculations will take longer**
    - Complexity of engine, additional complex inputs – shading, heat emitters, DHW etc.
  - **Many areas of final inputs still to finalise**
    - PCDB replacement, hybrid heat pumps, ventilation etc



# SAP10 & HEM / New Regulations

- **SAP 10.3 – An alternative**
  - Readiness of HEM
  - SAP 10.3 in development and to run side by side with HEM
  - Ability to lodge in both
  - Gives HEM time to develop
  - Final cut off date for SAP 10.3 to be decided.




**Design SAP 2005**
**Design SAP 2009**
**Design SAP 2012**
**Design SAP 10.2**
**Design SAP 10.3**

# SAP10 & HEM / New Regulations

- **Final Thoughts**
  - SAP 10 brings further changes.
  - Carbon and Primary energy differences.
  - Notional building becoming harder to beat.
  - HEM is the long-term replacement to SAP.
  - Wrappers to plug into the HEM engine.
  - In depth and more data entry points to be used.
  - Calculations to be more time consuming.
  - SAP 10.3 to be used alongside HEM's







Fabric Energy Efficiency

Primary Energy

Design SAP 2005
Design SAP 2009
Design SAP 2012
Design SAP 10.2
Design SAP 10.3

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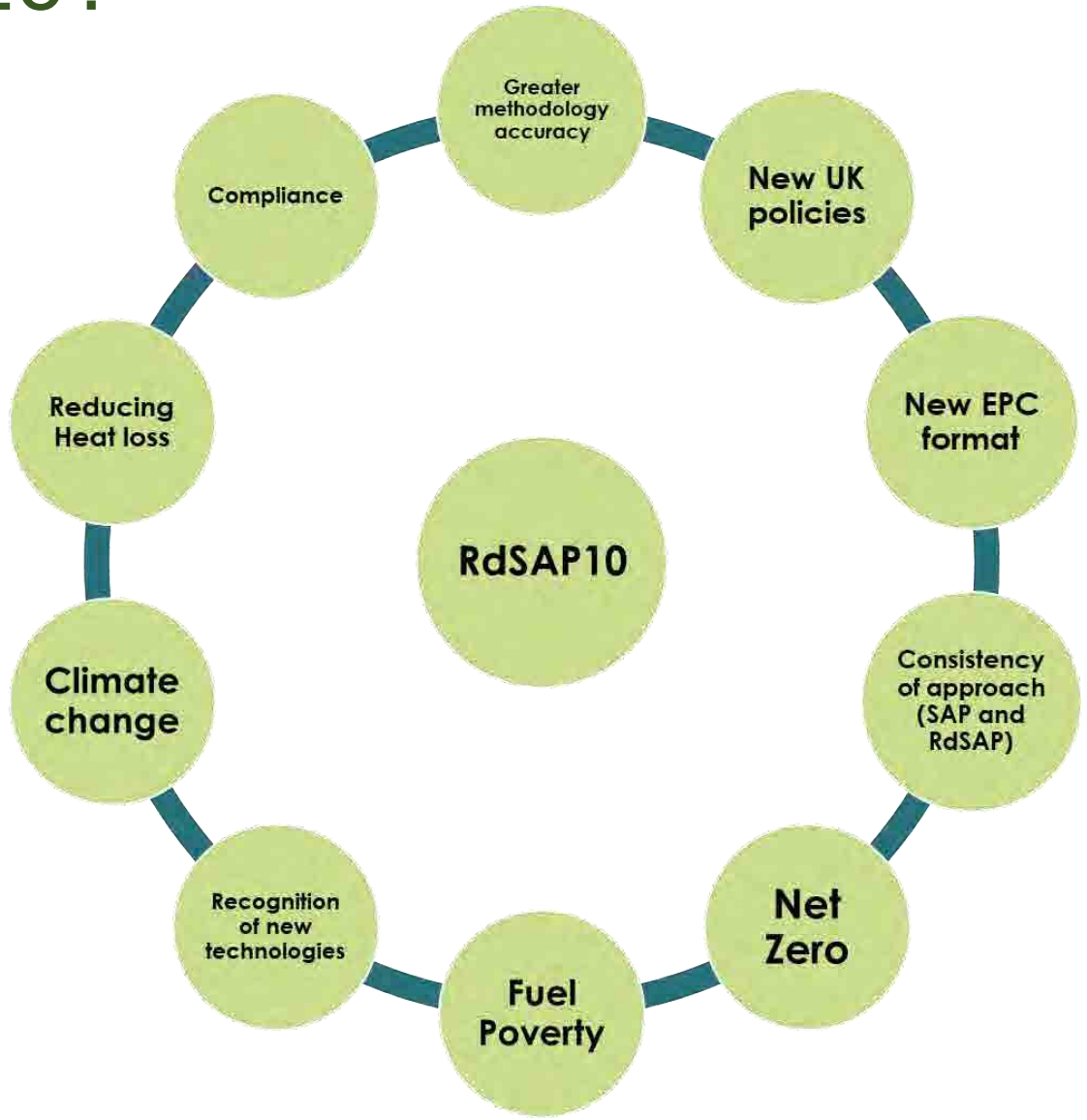
# RdSAP 10 Update

Malcolm Mooney, Elmhurst Energy

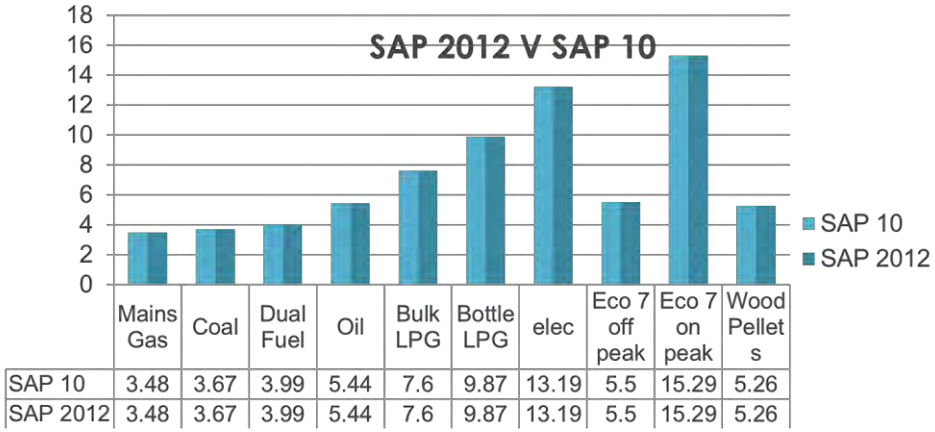


# Why RdSAP 10?


RdSAP10
Greater methodology accuracy
New UK policies
New EPC format
Consistency of approach (SAP and RdSAP)
Net Zero
Fuel Poverty
Recognition of new technologies
Climate change
Reducing Heat loss
Compliance

# RdSAP 10 Fuel Prices

- RdSAP fuel prices are to be independent of the fuel prices issued in SAP 10
- The RdSAP fuel prices will currently remain as issued for SAP 2012
- Change to RdSAP fuel prices will no longer be reliant on a change in Building Regulations
- They may be altered as and when Government believe it is in the interest of EPCs




| | Mains Gas | Coal | Dual Fuel | Oil | Bulk LPG | Bottle LPG | elec | Eco 7 off peak | Eco 7 on peak | Wood Pellets |
|---|---|---|---|---|---|---|---|---|---|---|
| SAP 10 | 3.48 | 3.67 | 3.99 | 5.44 | 7.6 | 9.87 | 13.19 | 5.5 | 15.29 | 5.26 |
| SAP 2012 | 3.48 | 3.67 | 3.99 | 5.44 | 7.6 | 9.87 | 13.19 | 5.5 | 15.29 | 5.26 |

# Key updates for RdSAP 10

Fabric changes

- Age band M (2023 onwards)
- Two alternative walls
- Solid wall u values based on wall thickness
- Roof room type 1 & type 2
- Insulation thickness changes
- New wall type – curtain wall
- Measurement of windows





# Key updates for RdSAP 10

Ventilation changes

- Database and default options – mechanical ventilation
- Options for ventilation extended
- Changes to definition of an open chimney
- Draught lobby
- Air pressure tests







# Key updates for RdSAP 10

Other key changes

- Lighting – known LED & CFL
- Basements
- Presence of a smart meter
- New technologies – PV batteries, small scale hydro
- PV diverters
- Cylinder size – actual capacity/loss







# RdSAP 10 Member resources




## Free Technical Bulletins

**Providing Non-Certified CPD**

We have released a number of updated technical bulletins taking you through the changes for RdSAP 10. These bulletins are available for members to read at their convenience, and they can also be used to claim non-certified CPD.

Summary of Changes in RdSAP 10: **VIEW HERE >**
Sheltered and Alternative Walls: **VIEW HERE >**
Rooms in the Roof: **VIEW HERE >**
Room in the Roof Flats: **VIEW HERE >**
Guide to Electric Meters: **VIEW HERE >**
Glazing, Doors and Draught Proofing: **VIEW HERE >**
DEA Heating Controls: **VIEW HERE >**
Determining Age Bands: **VIEW HERE >**
Floor Construction and Insulation: **VIEW HERE >**
Lighting Identification & Data Entry for RdSAP 10: **VIEW HERE>**
Ventilation: **VIEW HERE >**
Wall Construction Types: **VIEW HERE >**
Wall Insulation: **VIEW HERE >**



Northern Ireland



## RdSAP 10 Blog Posts

Read our most recent RdSAP 10 blog posts keeping you and the wider industry up to date with the upcoming changes for RdSAP 10:

- RdSAP 10 Set to Revolutionise Energy Performance Assessment for UK Homes >
- Need a Recap? Get Ready for RdSAP 10 with a Quick Refresher >
- Top 10 questions assessors ask about RdSAP 10 >
- RdSAP 10: What it means for Homeowners and Tenants >
- Beyond Box-Ticking: The Scientific Foundation of RdSAP and EPCs >
- Optional But Impactful: Air Pressure Testing in RdSAP 10 >

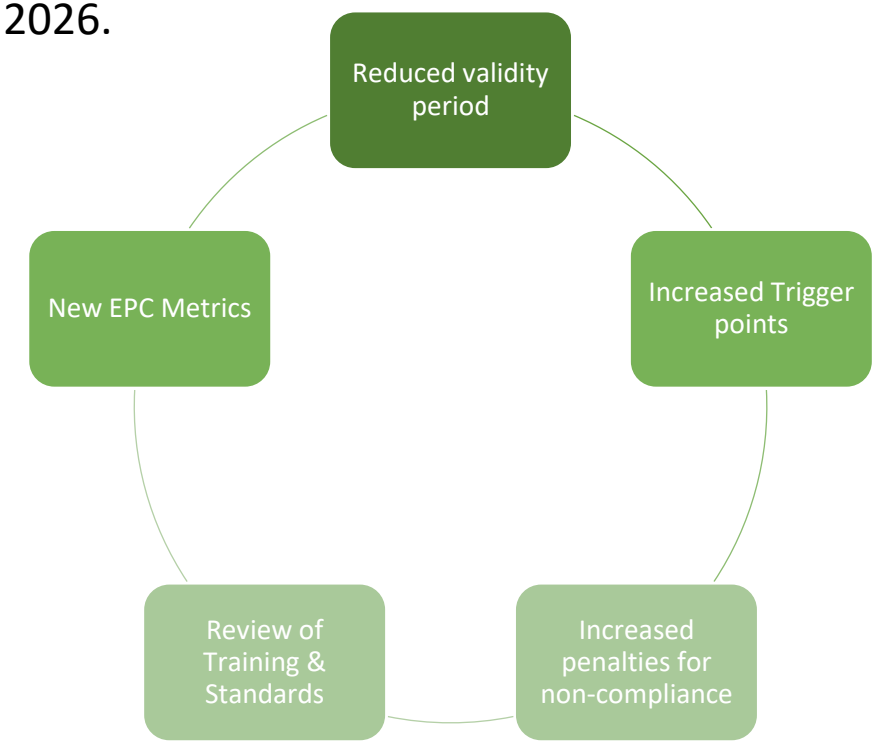
https://www.elmhurstenergy.co.uk/rdsap-10-member-resources/

# EPC reform



# EPC reform

- Consultation – Feb 2025
- Applies to England and Wales but likely outcomes of consultation will operate mutually in N.Ireland.
- Scotland have already released outcome of consultation – 2026.



# Proposed new EPC metrics

- **Energy cost**: helping individuals understand the financial implications of a building's energy efficiency and make informed decisions about potential improvements
- **Fabric performance**: assessing the thermal performance of a building's envelope
- **Heating system**: providing information on the efficiency and environmental impact of a building's heating source
- **Smart readiness**: assessing a building's potential to integrate smart technologies that can optimise energy consumption
- **Carbon**: an estimate of the carbon emissions arising from the energy used in the building
- **Energy use**: offering insights into overall energy consumption and identifying areas for energy efficiency improvements

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# RdSAP Go



# Benefits of RdSAP Go

**RdSAP Go Features**

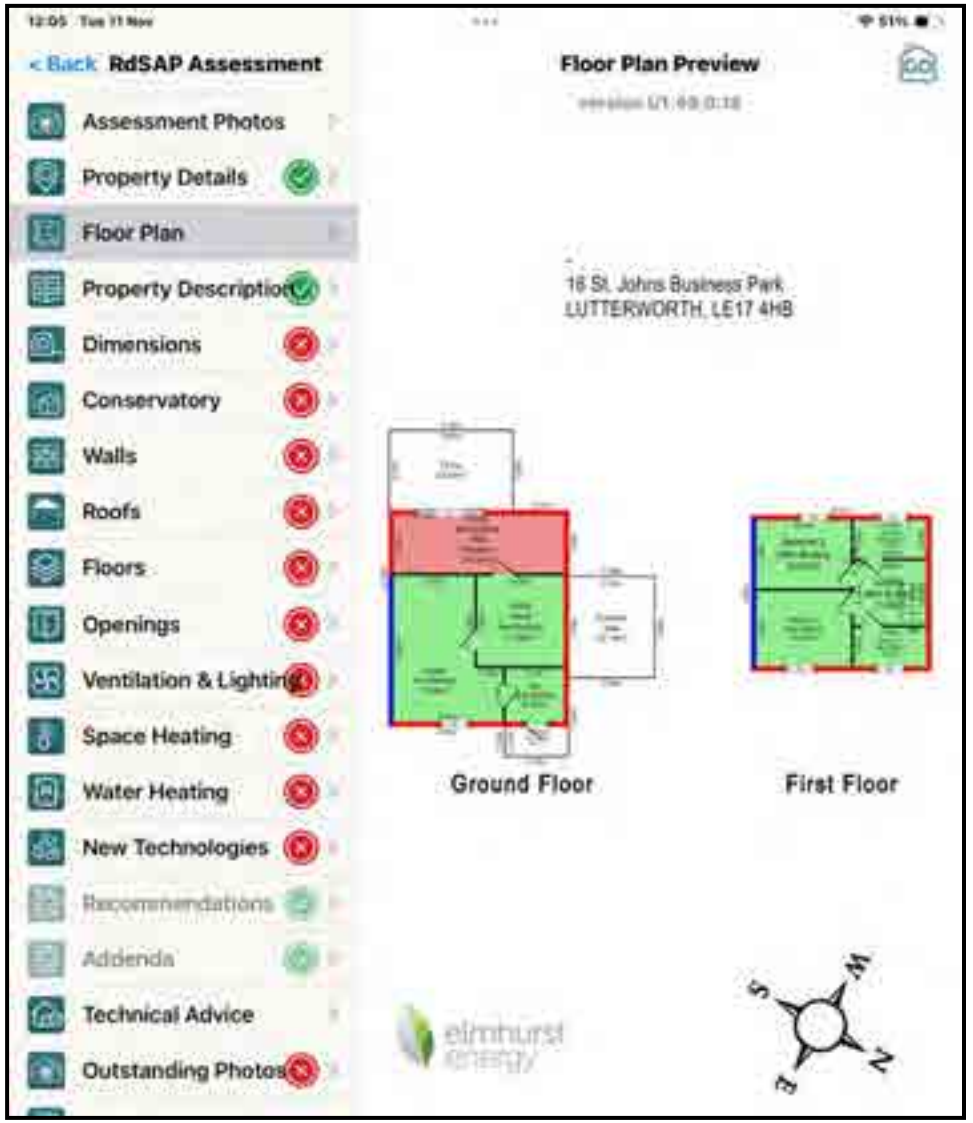
- ✅ Integrated camera for evidence capture
- ✅ Lodge EPCs from your device
- ✅ Submit Energy Reports from your device
- ✅ Input data in any order
- ✅ Optional 'Guidance mode' for in app support
- ✅ Upload photos and select photos already taken from your camera roll
- ✅ Added peace of mind with the 'Technical Advice' section, available to help assessors review potentially risky data entries
- ✅ Evidence for Audits can be marked as QA ready
- ✅ Upload complete or incomplete assessments to Access Elmhurst
- ✅ Offline data capture
- ✅ Simple panel functionality
- ✅ Can be used with PlanUP (only on iPad).

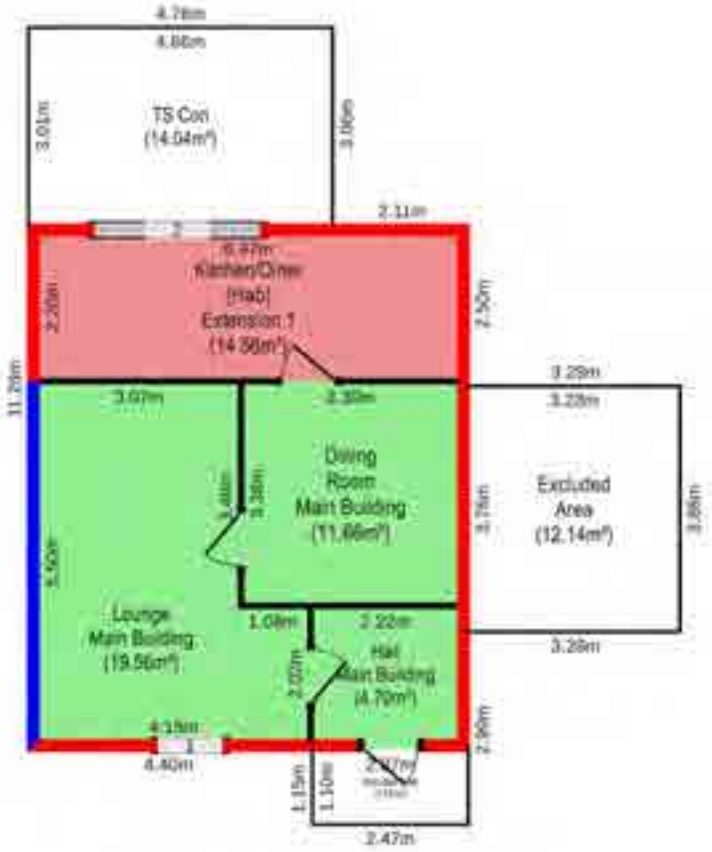


# Elmhurst floor plan tool



# Elmhurst Floor plan tool coming soon…



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# Q&A Session



# Afternoon Break

Our next speaker will be at: 14:20pm

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# The Importance of Airtightness Testing in Homes

Guy Fowler, Elmhurst Energy



# The Importance of Airtightness Testing in Homes

- Airtightness Since June 2022.
- Technical Booklet F1 & K requirements.
- Implications of the Test result in SAP and Ventilation designs.
- Testing in the RdSAP, Retrofit & Heat Pump installations.



# The Importance of Airtightness Testing in Homes

- ATTMA Standard TSL1




**Northern Ireland**

| Building Regulation Application Period | Tech Booklet F1 | Epc&SAP Version |
|---|---|---|
| 07.08.2006 > 30.10.2012 | 2007 | SAP 2005 |
| 31.10.12 > 29.06.22 | 2012 | SAP 2009 |
| 30.06.22 > onwards | 2022 | SAP 2009 * |

* 40% Reduction under previous standards

- Preparation includes, external doors and windows closed, internal doors open, known ventilators taped up only (including trickle vents) and water in traps checked.
- Any other temporary seals and tape is not permissible.

# The Importance of Airtightness Testing in Homes

- Technical Booklet K – Section 1.5
  - As with the rest of the UK there has been a trend for new builds to drop to much tighter levels of Air Tightness.
  - Mainly new builds but we are starting to see an impact within the retrofit sector on existing buildings.

1.5 It can be anticipated that there will be a continual trend towards more airtight buildings due to drivers for higher energy efficiency and lower carbon emissions. Through good design and construction, buildings can achieve an air permeability down to around 2 – 4 $m^3/(h\ m^2)$ of envelope area at 50 Pascal (Pa) pressure difference



# The Importance of Airtightness Testing in Homes

- Airtightness Since June 2022.
  - Types of Test.
    - Blower Door at 50pa / High Pressure Testing – Retrotec or The Energy Conservatory.





# The Importance of Airtightness Testing in Homes

- Technical Booklet requirements.
  - To achieve a result no greater than 10@50pascals.
  - Buildings that are not tested should be sampled and match the same type/design as the tested dwelling.
  - A plus 2.00 penalty is added, which dictates that the tested score can not be greater than 8@50pa.
  - If remedial work is required on the tested building, then we should look at the sampled types to check for the same quality issues.
  - Plus, an additional test to be tested from the sampled stock.



# The Importance of Airtightness Testing in Homes

- Implications of the Test result in SAP and Ventilation designs.
  - As we strive to more stringent designs, we start to see that move away from the traditional Level 1 fans.
  - The ability to build better more airtight homes then gives us the need to have the appropriate system installed.
  - Moving from 10.0 > 5.00 > 3.00 @50pascals, sees the need for those better systems.

  - It makes sense therefore to design with the anticipation of those better results. Rather than react to the Air Test at the as built stage and realise the Level 1 is deemed inadequate.



# The Importance of Airtightness Testing in Homes

- Testing in RdSAP, Retrofit & Heat Pumps.
  - With RdSAP changing in June 2025, we will now have the ability to override the current default figure of 15.0 m3/(h.m2)@50pa.
  - All though not mandatory, this could be the difference between achieving a better rating and moving from a 'D' to 'C' or 'B'

  - Within Retrofit we have seen the use of Pulse and 'Background Ventilation Testing' – BVT for short.
  - This type of test gives an Air Change (ach) result and can implicate the need to add additional background ventilation or to confirm that what is present is adequate.
  - In addition, we may then undertake an Air Permeability Test to ensure we have the right ventilation strategy for the dwelling.

  - Within the heat pump installation market, the ability to accurately enter an ACH rate into the sizing tool, can aid the size and cost of that installation.

# The Importance of Airtightness Testing in Homes

- To Summarise
  - We should be achieving a figure of under 10.0 m3/(h.m2)@50pa at the ‘as built’ stage.
  - The as built final figure should then be checked and used to validate the ventilation strategy used in the design.
  - Air testing will be used in other aspects of the industry as we want to understand the relationship between insulation upgrades, improved airtightness and ventilation.

## Build Tight & Ventilate Right

# Energy Assessors in the Public Eye

Sam Cantle, Elmhurst Energy



# Elmhurst Promoting You

- 95 pieces of media coverage last year alone
- 8 million views online
- 766,000 readers
- 111,000 social media shares



#ElmhurstNorthernIrelandConf25



Assessor competency shortfalls undermine credibility

Call for improved training for Energy Performance Certificate assessors

Government suspends 39 installation businesses for substandard solid wall insulation work

# The problem with Energy Performance Certificates

A Which? investigation has found that EPCs can be riddled with inaccuracies and unhelpful advice that could cost homeowners a fortune

10 Jul 2024



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Which?

Money > Property

# The energy ratings 'guesswork' corrupting Britain's house prices

As Labour scrambles to overhaul EPCs, The Telegraph can reveal:

- "Guesswork" by inspectors with just three days of training can knock thousands off a home's value.
- Near-identical homes can receive wildly different ratings, yet potential errors are reviewed by staff working from home.
- The ratings system is being "gamed" to access government grants or manipulate property prices.


Energy
assessor

# Anatomy of a crisis

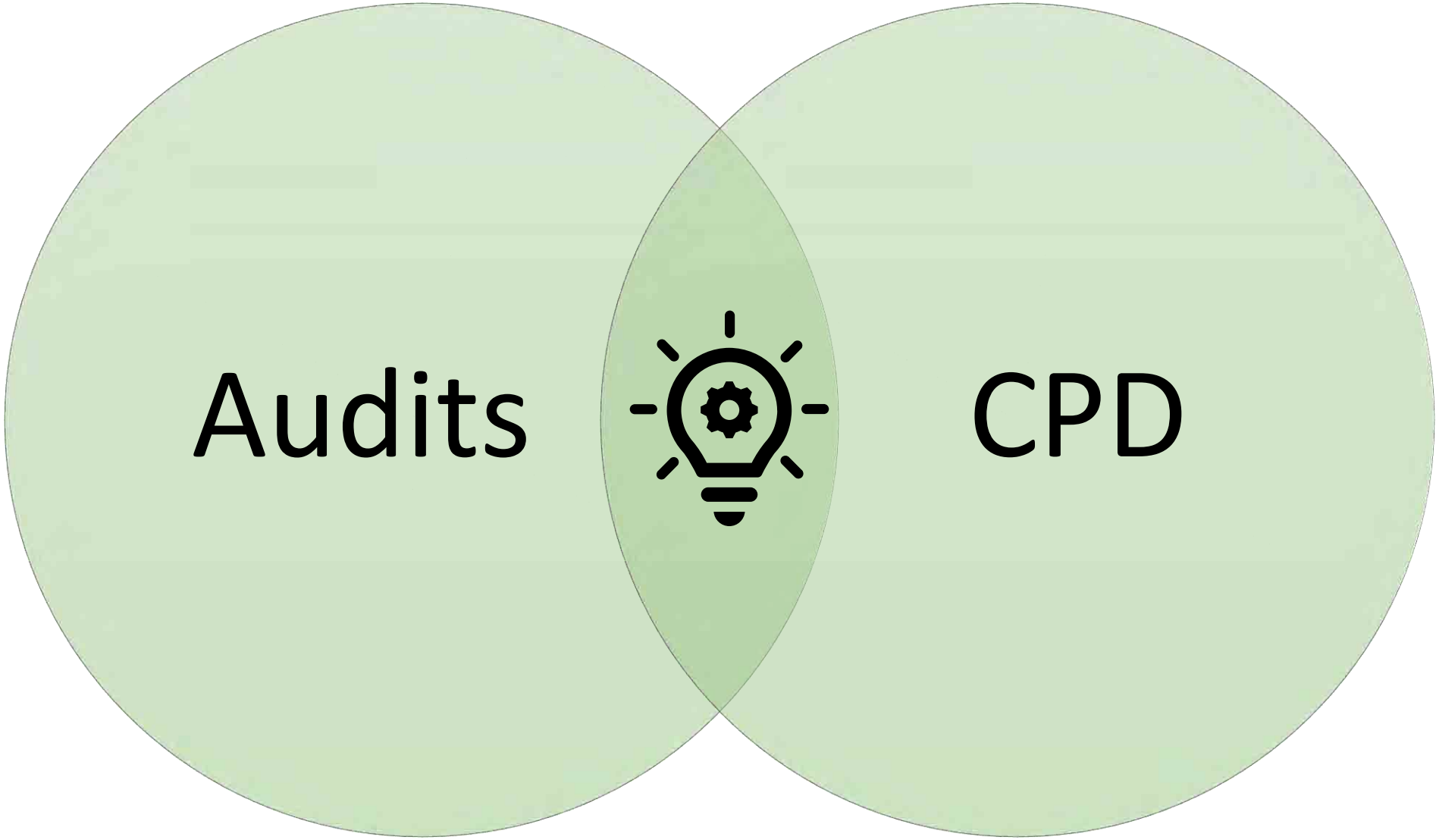
- **Media feeds on media…**

- Product doesn't work (anymore)
- Experts who are prepared to criticise the product
- Victims who relied on the product
- Collateral damage arising from the product
- People who sell the product

# How to avoid the crisis

"Mistakes are costly and somebody must pay. The time to correct a mistake is before it is made.
The causes of mistakes are, first, I didn't know; second, I didn't think; third, I didn't care."

Henry H. Buckley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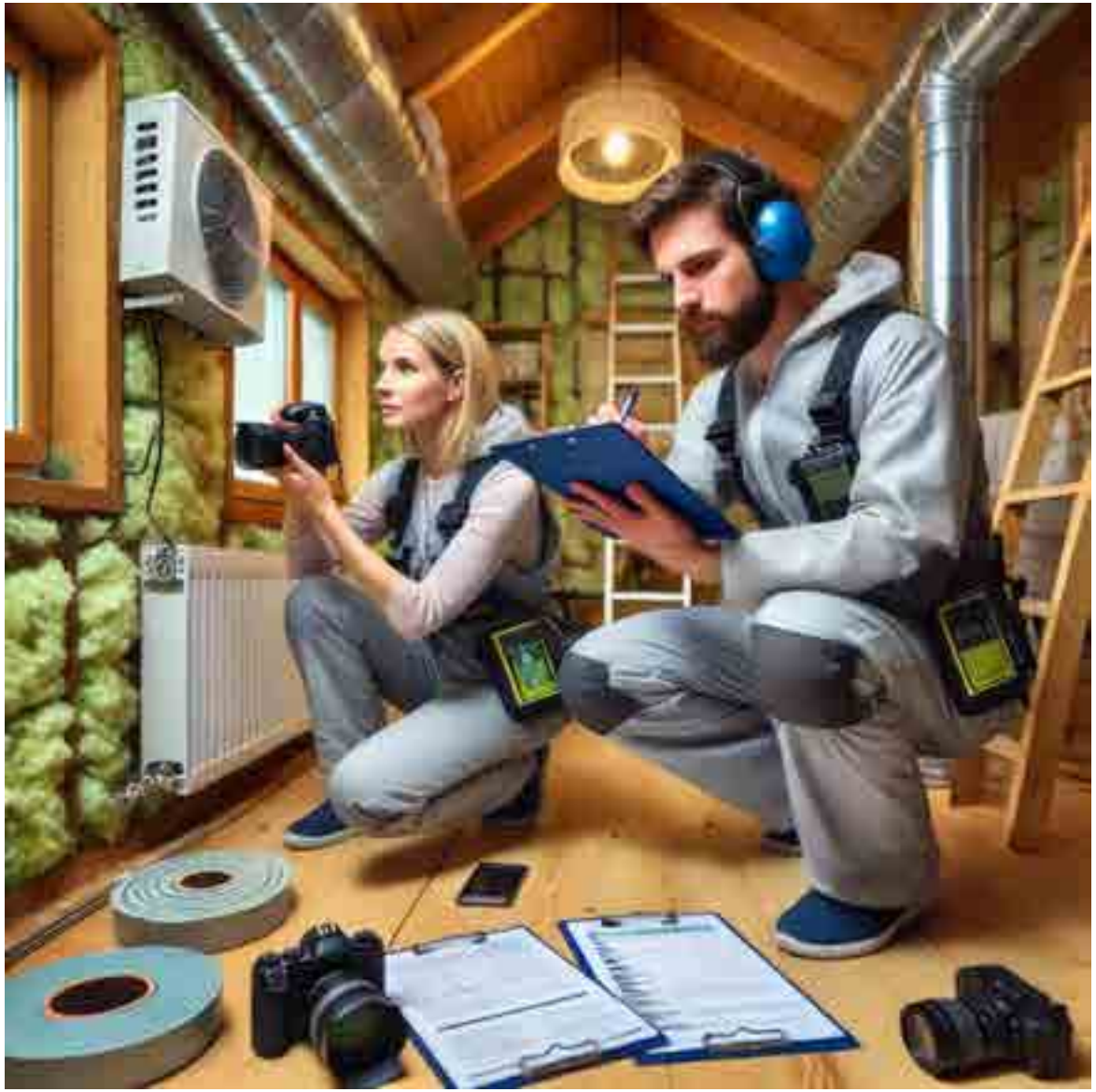




ENERGY EFFICIENCY


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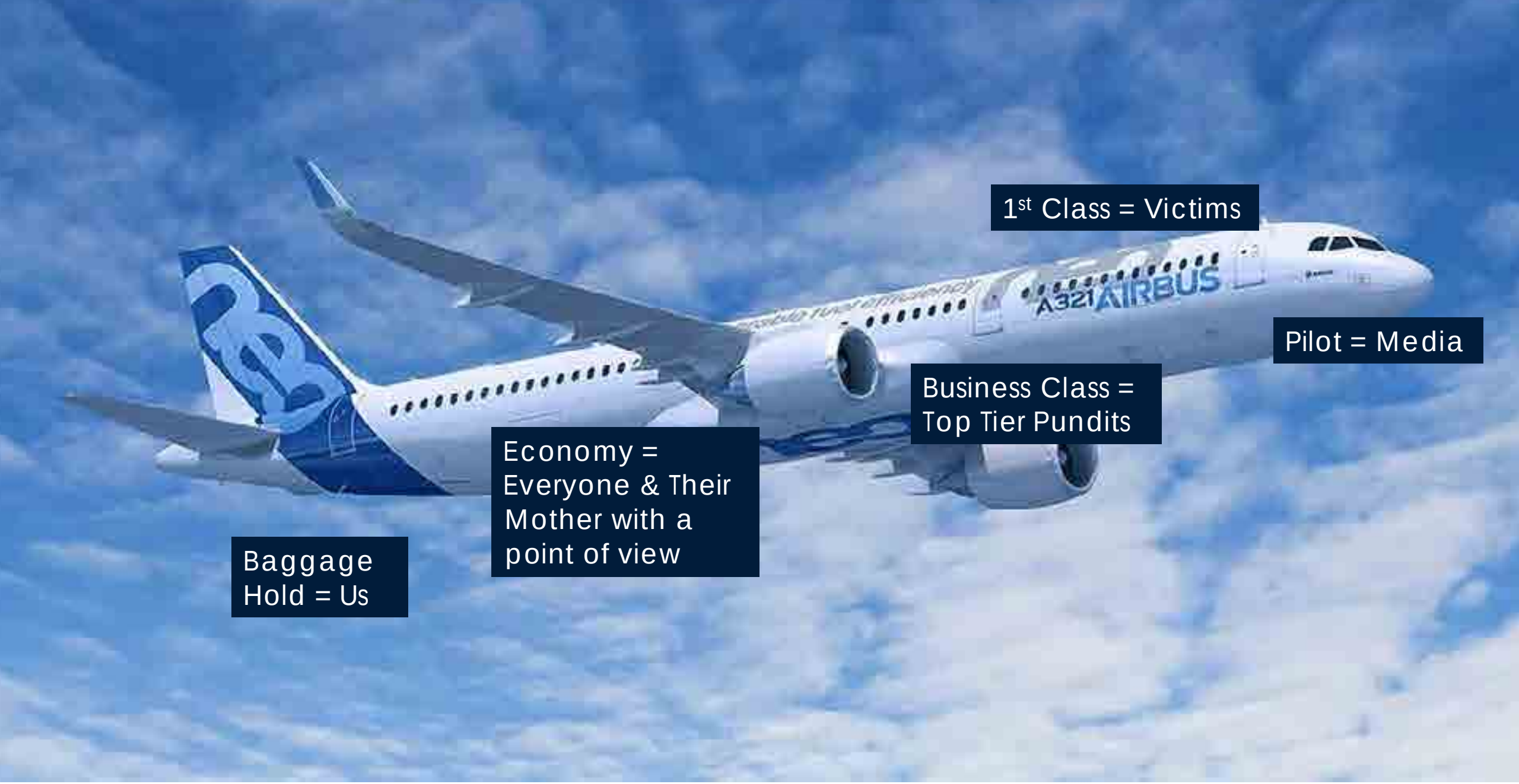
REPORT

# How to deal with the crisis


1st Class = Victims
Pilot = Media
Business Class = Top Tier Pundits
Economy = Everyone & Their Mother with a point of view
Baggage Hold = Us
A321 AIRBUS

# If a complaint gets to the media

- Don't ignore it
- Ask lots of questions
- Know the media's deadline – and stick to it
- Get help from the Elmhurst team
- Never diss the customer
- Keep comment as simple as possible
- Put it in writing
- Review afterwards – what could have avoided this?

“To make no mistakes is not in the power of man. But from their errors and mistakes the wise and good learn wisdom for the future.”

Plutarch

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# Q&A Session



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# Thank you all for attending

Ally Galloway, Business Development Manager,
Elmhurst Energy

