# RPS' TAKE ON: THE LEVELLING UP AND REGENERATION BILL / THE UK ENERGY SECURITY STRATEGY

## CLIENT BRIEFING

MAKING COMPLEX EASY

# THE STORY SO FAR

### Planning for the Future White Paper

The Planning for the Future White Paper was published in August 2020, with the Planning Bill then announced in the Queen's Speech last year. But subject to intense media scrutiny, the Bill was delayed. It was suggested this resulted from Government backbench criticism raised in response to the White Paper.

In February 2022, Michael Gove told Conservative backbenchers that plans for a standalone Planning Bill had been abandoned, but that planning reforms would be taken forward through the broader Levelling Up and Regeneration Bill.

### Levelling Up and Regeneration Bill

Following the Queen's Speech in May of this year, the Government unveiled the 'Levelling Up and Regeneration Bill' (LURB).

First coined during the 2019 general election, 'Levelling Up' is now at the core of government departments, evidenced (in part) by the change of The Ministry of Housing, Communities & Local Government, to The Department for Levelling Up, Housing and Communities.

In the two Queen's Speeches that followed the 2019 General Election, Levelling Up emerged as a key theme. At the Conservative Party's conference, Boris Johnson[1] said the UK has one of the most "imbalanced societies and lop-sided economies", when compared to other richer countries. He additionally stated the Conservative Party's mission "is to promote opportunity with every tool we have".

Initially anticipated to be published in October 2021, the Levelling Up White Paper came out in February 2022.

It includes 12 'missions' to reduce geographical disparities, with a target date for these to be achieved by 2030. These included:

- Empowering local decision makers through greater devolved powers
- Securing paths to homeownership
- Improving the interconnectivity of new and existing communities
- Investing in research and development
- Increasing the number of people completing high-quality skills training.

The Government stressed in the White Paper these policies are "only part of the answer to levelling up", and are "stepping stones on what must be a sustained journey of change"[2] .

# THE LURB – AN OVERVIEW

A large Bill, it contains 325 pages, 196 clauses and 17 schedules. In what was a key and fundamental measure set out within the Planning for the future White Paper, the 'zonal' style has been scrapped. But the LURB does contain fundamental and wide ranging changes to the way the planning system operates.

As part of the Levelling Up agenda, the LURB seeks to deliver reforms to the planning system. This is to ensure development is more 'beautiful', delivers improved environmental outcomes and produces more local infrastructure. It's also important it indicates the Government's intention for increased collaboration across departments and agencies, in addition to empowering local Councils and communities to deliver growth.

### Key measures include:

**Local Plans:** The way in which councils set the vision for future development in their area, and decide whether to give planning permission, will gain stronger legal weight once adopted and up-to-date. Communities will be given a substantial say in Local Plans. Currently, 61% of councils don't have an up-to-date local plan, leaving authorities at 'risk' of 'speculative' development and appeals. To incentivise plan production and ensure new Local Plans are not undermined, the Government will consult on changes to the National Planning Policy Framework (NPPF) to remove the five-year land supply test. This is where development plans are less than five years old, so as to curb 'speculative' and appeal development.

**Digitised Planning System:** Making plans and planning applications fully transparent and available on laptops and smartphones.

**Environment:** Stronger protections for the environment in Local Plans, and the introduction of new Environmental Outcomes Reports to replace EU processes of Environmental Impact Assessment and Strategic Environmental Assessment. The new Reports system will be an outcomes-based approach, allowing the Government to set clear and tangible environmental outcomes against which plans and projects are assessed.

**Local Design Codes:** To be made mandatory so that developers have to respect styles drawn up and favoured locally – from the layout or materials used, to how it provides green space.

**Duty to Cooperate:** The statutory requirement is to be replaced with a flexible policy-based test.

**Street Votes:** To allow residents to propose development on their street and have it approved via a micro referendum. This aims to provide a positive incentive for neighbours to consider in full the impact of proposed development, particularly in dense urban areas where there is demand for intensification and density increases.

**Infrastructure Levy:** The replacement of the Community Infrastructure Levy with a new Infrastructure Levy. The Infrastructure Levy is to set a framework which replaces the use of section 106 agreements and CIL with a new Levy set and raised locally. The new regulations will be established following full consultation, with the aim of having fixed local rates in response to local circumstances.

A lot of detail is yet to be determined and will be subject to future consultations and secondary, resulting regulations. Additional measures are likely to be introduced through amendments as the Bill goes through parliament.

# THE DETAIL: DESIGN CODES

The LURB contains a number of fundamental measures that may change the way the planning system operates. The detail will be important as the Bill passes through parliament and secondary legislation is announced.

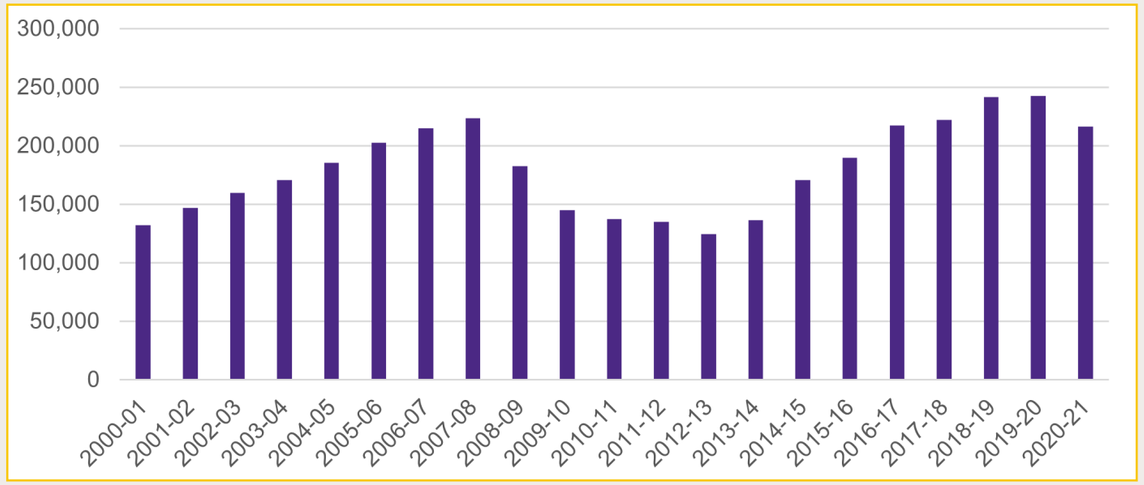
This section takes an initial view at the proposals for Design Codes set out within the LURB.

## Context

Essentially, the proposals for the introduction of Design Codes, along with all other measures identified within the LURB, are set in the context of an existing system that is struggling.

The UK's housing shortage is chronic and one of the biggest challenges the country faces. The Government is aiming to build 300,000 new homes every year to match demand and keep housing costs affordable. But as demonstrated in Figure 1 (top right), at no point in the last decade has there been a delivery of more than 250,000 additional new homes.

**Figure 1: Net Additional Dwellings supplied in England**




Housing need is acknowledged within the Levelling Up White Paper. It states: "The UK Government will continue working towards our ambition of delivering 300,000 new homes per year in England by the mid-2020s to create a more sustainable and affordable housing market"[3].

The context sitting behind the planning measures set out within the LURB is paramount in considering its impact.

The LURB requires local planning authorities to have a design code in place. This covers their area and acts as a framework for detailed design codes to be prepared for specific areas or sites led by local authorities, neighbourhood groups/forums, or developers.

**Figure 2**


However, authority wide design codes are nothing new. Design codes are defined within the NPPF as "a set of illustrated design requirements that provide specific, detailed parameters for the physical development of a site or area. The graphic and written components of the code should build upon a design vision, such as a masterplan or other design and development framework for a site or area."

The London Plan, which sets the spatial strategy for London, contains design code principles and has done since its inception. Design code elements include space standards, units per core and dual aspect requirements amongst others. In addition, the National Design Guide draws on long and well-established urban design principles such as scale, massing, form, materials and landscape.

The number and scope of design codes could, however, be significant. Figure 2 (to the right) demonstrates the boundaries of more than 300 local planning authorities in England[4] , each of which would be required to have a design code. In addition, localised Design Codes could go further and be created for very specific and detailed contexts, even down to individual sites or streets.

# BEYOND THE EYE – SUSTAINABILITY IN DESIGN CODES

Design Codes may relate primarily to the placemaking principles of future development within an area. But the RTPI research paper, 'Cracking the Code', written in partnership with the RSPB and LDA Design, considers the potential for Design Codes to contribute to net zero targets and aiding nature recovery.

Building upon the National Design Guide and the National Model Design Code, Cracking the Code calls for design codes that provide "vision for the kind of place communities want", with focus placed upon nature-based design principles.

The Paper identifies calls for integrated approaches to policy replated planning, net zero targets and nature recovery. This is in addition to a better understanding of technical concepts, and the need for a change of culture to consolidate climate positive attitudes and behaviours.

The Paper outlines five principles that should underline codes:

- Introduction of design codes earlier in the process
- Stronger focus on how to deliver net-zero and nature recovery
- Robust framework for environmental assessments
- Intentional delivery of the community's vision for the place
- Carbon and nature to be prioritised throughout design and development

## THE UPSIDE

Design Codes may give reassurance for developers and local communities, in respect of the form that emerging development proposals must take. This may in turn ease a shift in the national psyche to one of pro-development. This would enable development, and in particular housing development, to progress through the planning system without delay.

If design sustainability requirements are clearer and easier to follow, Design Codes may ultimately aid the speed at which important and necessary development can be built.

And in requiring standardised materials and construction techniques, Design Codes may enable the facilitation of more sustainable forms of development across areas. They also provide an opportunity for local authorities and communities to shape the spatial principles of their area, and prioritise development that is both needed, and fits with local placemaking values.

## THE FLIP SIDE

The question however, is whether the requirement for Design Codes will create a more seamless planning system.

Stuart Andrew MP, in an article for PoliticsHome, said: "The planning system as it stands is slow and bureaucratic. Despite the huge progress we have already made in driving up housebuilding, all too often the system delivers the wrong homes – ugly, shoddily-built, identikit creations – in the wrong places, without the required infrastructure."[5]

There is a significant risk however, that by imposing Design Codes, which would act as an additional layer to the plan making system, may delay the system even further. Coupled with the 'Street Vote' system and inherent subjectivity on design considerations, design codes may be the final straw, adding to what Stuart Andrew MP describes above as an already slow and bureaucratic system.

The LURB and its measures sit in a context of existing delays within the system. In real terms, local government core funding was reduced by 63 per cent in the decade to 2020.

A planning system that is properly funded by central government is critical to the implementation of measures within the LURB. Without this, existing problems may ultimately be exacerbated, leading to more frustration at all levels.

## MIXED MESSAGING?

The principle of Design Codes is undoubtedly commendable, and indeed community involvement is a pillar of the democracy we live in. As a country however, Design Codes must be viewed in the context of a chronic housing supply crisis. The question is, whether Design Codes will be able to cut through bureaucracy, are the right approach in ending the housing crisis, and facilitating efficient, sustainable development.

Ultimately, Levelling Up needs to be more than a process. Local Authorities must be given additional fire power to work effectively with key stakeholders. This is to deliver the changes that are needed, whether as part, or independent of, the LURB.

It remains to be seen whether the LURB can stimulate the housing growth required, or whether the abandonment of a standalone Planning Bill will represent a missed opportunity for the Government in delivering the housing growth needed within the country.

**References and further reading:**


[1]Johnson, B 'Keynote Speech', speech delivered to Conservative Party Conference 2021, 6 October 2021, https://www.conservatives com/news/prime-minister-boris-johnson-speech-conference-2021

[2]DLUHC, Levelling Up the United Kingdom, 2022.

[3]HM Government, Levelling Up the United Kingdom: White paper, February 2022.

[4]HM Government, Local government structure and elections, October 2021.

[5]Stuart Andrew MP, The Levelling Up and Regeneration Bill will put people at the heart of the planning system, 8 June 2022.

# OUR TAKE ON THE ENERGY SECURITY STRATEGY

## KEY DETAILS, FACTS AND CONTEXT

### Context

The UK Energy strategy arrives in the context of a global commodity crisis which frames four key challenges and priorities for the UK:

- The urgent requirement to reduce reliance on Russian fuel imports whilst maintaining security of supply
- The need to moderate and insulate against the impact of global commodity price rises on the UK public and its businesses
- The need to advance sustainability for environmental as well as economic reasons. This is a huge consideration and centres on the UK's commitment to reach its 2050 net zero target
- These goals must also be pursued in a manner that protects the fundamental affordability of energy. While high energy prices will strengthen the business case for sustainability in some areas (e.g. the benefits to businesses of self-generating renewables), extreme spikes in energy costs thwart business planning and dramatically curtail consumer spending power, which has negative impacts on the economy

### The overall goal of the Energy Security Strategy

The UK will speed up the energy transition to improve energy security and independence in the long-term. To this end, the strategy targets large capacity increases in nuclear, renewables and hydrogen, along with supporting domestic production of natural gas from North Sea fields.

The content of the Bill can largely be reduced into three main elements:

**Multiplying low carbon power principally through offshore wind and nuclear.**

- Target 95% low carbon production by 2030
- Triple nuclear capacity from 8GW to 24GW by 2050
- Quintupling offshore wind from 11GW to 50GW by 2030
- Quintupling solar capacity from 14 to 70GW by 2035

**Interim revival of oil and gas**

- Offshore gas licensing round to be launched in the autumn and assessed against the six forthcoming climate change compatibility checkpoints
- Onshore gas geological surveys
- Commitment to carbon capture and storage roadmap

**Focus on UK hydrogen production, developing the required infrastructure, and securing a competitive advantage in the global hydrogen market**

- Doubling production target from 5 GW to 10 GW by 2030 with at least 50% green hydrogen produced by renewable generation. Annual allocation rounds are planned for green electrolytic hydrogen that will be moving to price-competitive allocation by 2025
- Hydrogen transport and storage – the Government is committing to accelerate the design of new business models by 2025 that speed the development of infrastructure to facilitate hydrogen transport and storage.
- Support UK competitiveness in the global hydrogen market through the creation of an import-export certification scheme that differentiates high-grade production

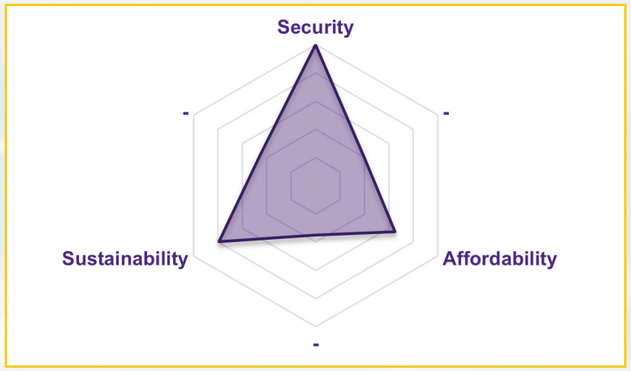
# OPINION PIECE – EFFECTIVENESS, CHALLENGES & MARKET IMPACTS

**Security / Affordability / Sustainability**

The effectiveness of the Energy Strategy will hinge largely on how well it straddles three (sometimes competing, sometimes synergistic) priorities – namely security, affordability and sustainability. This difficult balancing act is termed the 'Energy Trilemma' and provides a useful framework contained in the paper.

**In a nutshell:**

- The Strategy strives to prioritise Energy Security (as per its namesake) whilst minimising fallout on sustainability and affordability with varying degrees of success.
- Sustainability issues are addressed but almost exclusively on the supply side of the economic equation – setting ambitious targets for nuclear and offshore wind, but remaining largely silent on demand-side measures like support for energy efficiency. No strategy or legislation exists in isolation, however. The Bill sits in the context of wider government policy that does provide multiple budgeted lines of support for demand-side response & efficiency measures.
- However, the trade-off for the scale of investment required, and the associated costs over ambitiously compressed timeframes, means that affordability is likely to take a significant hit, at least in the near-to-medium term.






## 6 KEY WATCHPOINTS

1

**The rate of innovation lags Russian decoupling = Supply disruption and near-term cost increases**

Whilst the industry focuses on delivery technologies that take time to develop, the Government's proposals imply significant technology-related and project-related development horizons (small nuclear reactors are expected by 2029 at the earliest). The lead time on development lags the imminent phase-out of Russian fuel imports at the end of 2022. As multiple countries across Europe embark on similar efforts to substitute resources, the risks of continent-wide supply disruption comes into focus – heightening further elevations in the prices of key commodities. The UK, for the moment, is highly exposed to international markets, meaning that UK consumers will be sharply affected, and experience further rises in the basic cost of living.

2

**Ambitions to quintuple offshore wind (without concomitant support for onshore wind) = higher capital expenditure and significantly more complex infrastructure build-out.**

Although offshore wind has a higher capacity factor (sometimes generating 40-50% more power per turbine), this is rarely sufficient to offset the higher development and maintenance costs; a reality borne out by Levelised Cost of Energy (LCOE) metrics. Ultimately the prioritisation of offshore wind is (while still competitive with other energy sources) likely to drive higher prices than would be achieved onshore. In addition to the basic economics, the proposed scale and speed of delivery will generate proportional stresses on supply chains, logistics and permitting.

In particular, the pressure on manufacturers could lead to further elevations in capital cost above baseline EPC levels. Absent changes to current planning restrictions, the development of onshore wind will be disadvantaged in relative terms.

3

**Increasing nuclear capacity = introduces higher costs alongside environmental opportunity-costs**

Nuclear is by far the most expensive form of utility scale energy production when unsubsidised capital construction costs are factored in. Lazard's latest report of the levelized cost of energy (LCOE) lists the following:

- LCOE for utility scale solar at $30-41 per MWh
- LCOE for utility scale wind at $26-50 per MWh
- LCOE for nuclear at $131-204 per MWh[1]
- At $41 per MWh, utility scale solar is around 68.7% cheaper per unit of electricity than nuclear at $131 per MWh.
- From an investment standpoint, renewables straightforwardly qualify as a more productive use of capital versus nuclear. The difference is easy to quantify. Each $ invested in nuclear delivers 7.6 kWhs of electricity. Utility-scale solar delivers triple this output at 24.4 kWhs per $ invested (triple the energy output also means triple the potential for emissions reduction when used to displace fossil fuels as an energy source).
- The spread between these energy yields (16.8 kWhs per $ invested) represents the enormous opportunity-cost of nuclear; more than 2.2x its entire productive output (economically and environmentally).

## 4

**Network expansion is critical to both energy security and sustainability = but increasing consumer/taxpayer costs**

The rapid expansion of renewables must be twinned with the availability and smooth intermittency of adequate provision for energy storage  smooth intermittency and ensure availability.  The Energy Security Strategy seeks to address these needs through 'Holistic Network Design' and a corresponding 'Centralised Strategic Network Plan'. The overhaul of the current system will be coordinated through an independent Future System Operator (FSO) tasked architect to secure net zero energy system.

There will be a need to deliver regulatory and planning reforms that reduce lead times for such things as planning, consents and licensing across multiple energy technologies. The complexity of this effort heightens the likelihood of disruption, especially in relation to capital or infrastructure projects. In the near-term this is likely to drive cost increases.

## 5

**New licensing round for North Sea gas = limited benefit to energy security unless accompanied by corresponding investment in gas storage.**

- Deloitte anticipates that the "Increasing demand for supplier resources" (particularly as expertise shifts away from Oil and Gas to other energy sectors), "could lead to project delays and cost challenges [adding] to higher maintenance costs for late life assets in the mature basin."
- Impacts on UK energy security will be moderate, but not decisive. This is because once licensed, North Sea gas belongs to the license-holders (often foreign companies) who are under no obligations to increase retention and consumption within the UK. As an example, the Glengorm gas field license is 50% owned by Chinese firm CNOOC and 25% held by French owned Total.
- Proposed checkpoints to govern the licensing round allow foreign license holders to extract fuel for themselves with the soft proviso that the UK "remains a net importer of oil and gas."[2] However, the market forces that govern gas distribution are likely to protect UK energy security without any explicit regulation or enforcement. While there is some distribution of gas away from the UK, distribution costs have historically been sufficient to protect the UK's status as a net importer of gas, despite significant foreign ownership of licenses.
- The real elephant in the room is chronic underinvestment in UK gas storage. Without adequate storage capacity, domestic production does very little to insulate against commodity price volatility. The UK currently has just 2% storage capacity vs circa 30-40% typical across Europe.

## 6

**Doubling of UK Hydrogen production = potential benefits to energy security, but highly expensive and not currently cost-competitive**

- Hydrogen is costly and building a hydrogen economy will require substantial investment.
- According to data from S&P Global Commodities, the UK is globally the most expensive country for hydrogen production for all methods where S&P has data (with the sole exception of Autothermal reforming where there is data for just two countries, the UK and Netherlands). See Table 1 below
- Costs of hydrogen production in the UK and Europe are currently elevated due to secondary impacts of the Russian invasion of Ukraine. This has heightened the cost electricity and feedstock gas – both implicated in hydrogen production
- The cost UK production currently sits at a 4-5x multiple of the global front-runners in the US and Middle East
- Deloitte notes that alongside production costs, hydrogen also carries significant cost for storage and transport. This means that commercial competitiveness will be disproportionately driven by localised applications[3].
- The export of UK hydrogen to international markets is unlikely to be cost-competitive – however the Energy Security Bill sidesteps this; proposing the creation of a British import-export certification scheme that sets standards by which to differentiate high-grade production. The rationale, is that while the UK may struggle to compete internationally in terms of cost, it may be able to compete on quality instead. The certification scheme may help facilitate this.
- In terms of energy security, hydrogen is best described as an energy vector that can be produced from a wide variety of primary sources. This provides short-term production flexibility if one type of primary energy source were to become unavailable, or scarce. The result is that end-use devices using hydrogen would be decoupled from supply interruptions, affecting a given commodity. Adaptation towards a hydrogen economy can therefore play an important role in enhancing UK energy security.

**Table 1**

| UK vs Global Hydrogen Production Costs | | | | | |
|---|---|---|---|---|---|
| Source: S&P Global Commodity Insights \| Hydrogen Production Costs[4] | | | | | |
| Primary Substrate | Production Method | UK production cost | UK Global Rank for Affordability (highest is least affordable) | Country with Lowest Production costs | |
| April 2022 | UK Global Rank for Affordability | $15.7 per kg | 20th of the 20 countries with available data | US Midcontinent | $3.23 per kg |
| (highest is least affordable) | Alkaline electrolysis | $13.14 per kg | Joint 19th of the 20 countries with available data | US Midcontinent | $2.33 per kg |
| Methane + Heat | Autothermal reforming + CSS | $5.46 per kg | 1st of the 2 countries with available data | UK | $5.46 per kg |
| Methane + Steam | Steam Methane Reforming + CSS | $8.61 per kg | 7th of the 7 countries with available data | Qatar | $4.93 per kg |

# SUMMARY OF SECURITY-AFFORDABILITY-SUSTAINABILITY MERITS

| Strategy Components | Merits | | |
|---|---|---|---|
| | Energy Security | Affordability | Sustainability |
| **Speed of Russian Decoupling** | ☑ | ☒ | n/a |
| **Prioritisation of Offshore Wind** | ☑ | ☒ | ☑ |
| **Increase in Nuclear Capacity** | ☑ | ☒ | ☑ / ☒<br>Debateable: nuclear is zero-emission. But commercially it produces less energy per £ of capital invested. The capital could be used more productively in renewables where LCOE is 68% cheaper. From an capitalist opportunity-cost perspective nuclear is a drain on sustainability |
| **Network Expansion** | ☑ | ☒ | ☑ |
| **North Sea O&G licensing** | Important but limited impact on energy security absent corresponding investment in gas storage. Domestic production alone is necessary but not sufficient to insulate against the impact of commodity price volatility. UK currently has just 2% storage capacity vs circa 30-40% typical across Europe. | ☒ | **Neutral**<br>Assuming that domestic production simply displaces import but is not additive |
| **Hydrogen doubling** | ☑<br>Although Hydrogen is best described as an energy vector, it can be produced from a wide variety of primary sources. This provides short-term production flexibility if one type of primary energy source were to become unavailable / scarce / disrupted. The result is that end-use devices using hydrogen would be decoupled from supply interruptions affecting a given commodity. Adaptation towards a hydrogen economy therefore promotes energy security | ☒ | **Neutral**<br>H is an energy vector not a source |

# COMMENTARY ON LACK OF DEMAND-SIDE MEASURES IN THE ENERGY SECURITY STRATEGY

The Bill has faced widespread criticism. The lack of focus given to energy efficiency measures has been highlighted, which can help improve energy security, by reducing that ratio of consumption to supply. Gillian Charlesworth, CEO, Building Research Establishment (BRE) notes: "The Energy Security Strategy was a supply-side strategy whereas we are facing an urgent demand-side problem".[5]

Likewise, the Federation of Master Builders (FMB) has argued the Strategy fails to deliver for builders, with no significant measures announced to improve the UK's 29 million energy inefficient homes: "This was an opportunity for Government to implement a National Retrofit Strategy, focussing on improving the energy efficiency of the UK's draughty and leaky homes."[6]

However, while the Energy Security Bill doesn't not make equal provisions for efficiency, this is only part of the picture. The Bill does not exist in isolation as a standalone measure, but arrives in the context of wider government policy that provides multiple budgeted lines of support for demand-side response and efficiency measures:

- **The Home Upgrade Grant** will provide £950 million over 2022/23 to 2024/25 to upgrade insulation and install lower-carbon heating in low-income homes[7]
- **The Social Housing Decarbonisation Fund** will provide £800 million over 2022/23 to 2024/25 to upgrade a significant amount of the social housing stock currently below Energy Performance Certificate (EPC) C
  up to that standard[8]
- **The Boiler Upgrade Scheme** will provide £450million over 2022/23 to 2024/25 in upfront grants towards the cost of a heat pump or biomass boiler[9]
- **The Energy Company Obligation (ECO4) Scheme** will provide £4bn between 2022 and 2026 (£1bn per year) to introduce energy efficiency measures for homes such as loft or wall insulation, or heating measures[10]

| Energy Efficiency Measures | Timeframe | Strategy | Budget |
|---|---|---|---|
| Home Upgrade Grant | 2022/23 to 2024/25 | Heat and Buildings Strategy | **£950 million** |
| Social Housing Decarbonisation Fund (SHDF) | 2022/23 to 2024/25 | Heat and Buildings Strategy | **£800 million** |
| Boiler Upgrade Scheme | 2022/23 to 2024/25 | Heat and Buildings Strategy | **£450 million** |
| Energy Company Obligation (ECO4) Scheme | 2022 to 2026 | Heat and Buildings Strategy | **£4 billion** |
| | | | **Total £6.4 billion** |

# SERVICE, TRANSACTION & COMMERCIAL OPPORTUNITIES

**What is the overall impact on the market?**

The most notable impact (partly driven by the Bill, and partly by macro forces) is continued elevation in energy costs. The ability of service providers to alleviate cost pressures will be the primary value proposition, differentiator and commercial driver. Energy, in many cases, will be the largest single driver of costs – money is fungible – and therefore arises a commercial imperative on all cost reduction opportunities, energy related or otherwise. This highlights several points of focus:

## HOUSING & PROPERTY DEVELOPERS

**Basic routes to consider which may add value in a high-cost inflationary environment:**

- Solar self-generation to reduce grid reliance (both retrofit and on new developments)
- Integration of Battery Storage to maximise solar value proposition
- Air Source Heat Pumps (ASHPs) to electrify heat and shift away from gas

**Innovation opportunities & prospects for low-carbon communities:**

- Explore algorithmic energy management to maximise value gains from solar, storage, and ASHP, and have better control of thermals
- Explore how 'condition monitoring' through electronic signatures can drive down other costs of maintenance and insurance
  - A study by the U.S. Department of Energy Operations and Maintenance reports that preventive maintenance can result in energy savings of as much as 18%
  - Condition monitoring may help cost-benefit appraisal of retrofit opportunities that will produce operating cost savings for the property
  - Energy tracking at the circuit level to record consumption from hundreds of pieces of equipment per building every second of every day. An accurate schedule of when equipment is running enables sustainability departments to determine if any systems are on when there are no occupants. This would indicate wasted energy and a no-cost way to produce sizable savings
  - Condition-based predictive maintenance reduces downtime and call-out costs. Instead of time-based schedules for adjustments, replacements, and inspections, use real-time feedback from the equipment itself to determine when maintenance should be performed
  - Proactive shutdown to protect against fire risk

**Innovation opportunities and prospects for low-carbon communities:**

- Explore potential for collective storage (street level batteries) to reduce cost
- Explore leveraging your unique access to land for renewable generation
  - Supply to householders via virtual PPA:

    Consumers need both housing and energy - why give this market away to energy companies when renewable development has simplified, virtual PPAs are a thing, and you have access to the land?
  - Supply to householders via local energy microgrid:

    More lucrative, but Ofgem supply licensing may be difficult
  - Pure Revenue to subsidise research & rollout of other sustainability offerings that make you more competitive
- Explore leveraging your unique access to land for natural capital approaches centred on nutrient neutrality, reduction in flood risk, unlocking development land, and supporting value of housing assets (in partnership with local authorities)
  - Projects can be monetised through insurance contracts
  - Potential Benefits / commercial opportunities are:
    - Unlock / improve viability of land for housing development
    - Potentially lucrative: buy land at discount, de-risk and qualify it for housing, then develop and sell. Partner with banks, insurance companies and local authorities
- Explore Hydrogen Boilers for Residential Heat
  - Future of Energy Scenarios 2020 projects an additional 17TWhs of hydrogen needed in a consumer transformation scenario. Investors could use a Regulated Asset Base RAB model
- Explore sustainable use of building materials
  - Timber
    - Timber for example, is an inherently sustainable and a renewable resource. Timber sequesters carbon during tree growth and, when used in buildings, it locks this sequestered carbon within the building. It is a structural solution with significantly lower upfront embodied carbon emissions than concrete or steel
    - According to the Timber Accord, building 200,000 new houses in timber would store around 4 million tonnes of carbon dioxide each year, equivalent to the carbon emissions of approximately 2.4 million London to New York return flights
    - It does however, carry acoustics and risks of condensation so needs proper application
- Concrete reduction
  - Efficient design & offsite construction
- Layers outside the building structure
  - Use of bio-based materials and materials of high recycled content in those layers can reduce the environmental impact of a project
  - Insulation products made of mycelium
  - Furniture made of waste plastics from various post-consumer and post-industrial sources
  - Boards and insulation made of hemp
  - Cradle-to-cradle certified products

# AVIATION SECTOR

**Consider the integration of predictive asset management to reduce cost, energy consumption and $CO_2$. The components for predictive maintenance include:**

- Airside assets (Aerobridges, passenger coaches, cargo vehicles, refuelling trucks)
- Landside assets (Baggage handling systems, elevators and escalators, building facilities like lighting, HVAC, security and surveillance, power back-up systems, etc)
- Sensors and gateways
- Enterprise asset management platform and predictive maintenance SaaS solution (central data repository, ingests and analyses asset performance data offering critical insights to airport managers on asset health, proactive maintenance etc)

**These can help support operational expenditure savings alongside overall environmental and operational efficiency. Integration of predictive asset management can help:**

- Monitor, maintain, and optimise assets for better availability, utilisation, and performance
- Predict asset failure or quality issues and minimize unnecessary maintenance
- Pre-schedule maintenance ahead of failure to minimise downtime and organised more cost-efficient O&M

Finally, airports may wish to position themselves as hydrogen-ready hubs. Hydrogen's suitability as an energy vector means it's likely to become a key enabler in efforts to decarbonise aviation. Although the technical innovation required for hydrogen-powered planes is already underway, it's not yet complete. When hydrogen fuelled planes do reach full viability however, the leading airports will be those which have the necessary infrastructure to land, fuel and host them.

Hydrogen opportunities also extend to the terminal itself. It now seems likely that hydrogen gas blending may serve as an interim precursor to eventual full hydrogen heating of terminal buildings. For this reason, airports should seek to capitalise on forthcoming government initiatives detailed in the Energy Security Strategy to begin developing onsite infrastructure for green hydrogen production through electrolysis. This is because hydrogen distribution is a significant contributor to overall cost. By eliminating this cost, airport owners who invest in on-site production will have a distinct commercial advantage, and may be able to develop hydrogen into a major revenue source.

Airport owners should also seek to forge pre-commercial alliances with transport operators to begin incremental early-stage build out of the necessary infrastructure. These measures will help ensure that airports are hydrogen-ready ahead of time to support wholesale transition in the aviation sector when it occurs.

# CONCLUSION

The UK Energy Security Strategy aggressively (and asymmetrically) targets future energy 'supply' as its principal focus; laying out ambitious proposals for solar, offshore wind, nuclear and domestic gas production. While the Bill offers little that addresses energy security on the 'demand' side of the equation, it sits within a wider programmatic context of government measures that allocate over £6 billion toward energy efficiency measures this Parliament.

Notwithstanding this caveat – 'consumption discipline' deserves at least equal focus as a driver of energy security. The fact that energy efficiency measures offer a more intrinsically sustainable path to security (vs domestic gas production), and a more economically productive route to security (vs nuclear or hydrogen) is not lost on commentators.

The Bill navigates the Energy Trilemma' by prioritising long-term security of supply principally (though not exclusively or straightforwardly) through sustainable means. Nuclear may be a zero-emission fuel, but detracts significantly from emissions reduction potential when evaluated on a per $ basis. Without storage, the UK remains highly exposed to international price volatility. This leads us finally to the weakest element of the Security strategy – affordability.

The scale (quintupling capacity), speed (in many cases a 2030 horizon), and the choices of investment (notably nuclear) threaten a perfect storm of high development costs, supply chain pressures, and a system-wide overhaul that is likely to drive higher prices in a timeframe that coincides with the phase out of Russian fuel from the energy mix. This will deliver a particularly sharp hit to both the cost of business and living.

The impact on the market will be a wholesale refocusing on cost-reduction and cost-discipline as a core value-proposition (tightening the link between economic & environmental sustainability). For housing developers, this means enabling much greater (and more effective) utilisation of decentralised micro-generation. This can be achieved by capturing 100% of solar output as rising electricity prices make battery storage more economical. Algorithmic control can add further value, coordinating battery discharge with air-source-heat-pumps and live weather data to optimise the thermal mass of homes in ways that historically were not possible.

Property developers and housing associations operating at larger scale may also be able to facilitate cost reductions through peer-to-peer energy trading – facilitating the transition from individual low-carbon premises to low-carbon communities that redistribute energy within their network; matching supply & demand at a significant discount to the market rate. The possibility of peer-to-peer trading drives a convergence of expertise and commercial interest between developers and electricity companies focused on energy transition.

Strategic land developers, or those involved in large-scale residential development, may wish to consider repurposing unproductive or under-productive land assets for commercial scale Solar PV generation – using the positive cashflows to subsidize other sustainability related objectives. In the context of large housing developments, Solar PV could also be used in conjunction with centralised battery storage to offer discounted low-carbon electricity to entire cohort – differentiating the real estate value in the context of rising interest rates. Similar innovations are possible for business parks, especially where energy consumption is high. Large-scale regeneration projects may not have sufficient land for Solar PV but may be able to innovate around centralised battery storage.

Likewise, the aviation sector will seek to leverage technology to achieve more sustainable, more efficient, less wasteful resource management. The advent of 'electronic signature' and appliance level 'condition monitoring' may support new forms of predictive asset management that lower maintenance costs and reduce downtime – improving the availability of airport infrastructure and optimising energy usage. Leading airports will find opportunities for on-site hydrogen production. By eliminating distribution costs through on-site production, airport owners will likely be able to serve one of the largest global markets for hydrogen in a high completive manner.

**Web links:**

[1]https://www.lazard.com/media/[451905]/lazards-levelized-cost-of-energy-version-[150]-vf.pdf

[2]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/[1042291]/oil-gas-licensing-checkpoint.pdf

[3]https://www[2].deloitte.com/content/dam/Deloitte/uk/Documents/energy-resources/deloitte-uk-energy-resources-investing-in-hydrogen.pdf

[4]https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/[052022]-gas-imports-to-europe-drive-down-april-hydrogen-production-costs

[5]https://bregroup.com/news/bre-responds-to-the-uk-governments-energy-security-strategy/

[6]https://www.building.co.uk/news/industry-leaders-attack-lack-of-retrofit-focus-in-supply-side-energy-strategy/[5116924].article

[7]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/[1036227]/E[02666137]_CP_[388]_Heat_and_Buildings_Elay.pdf

[8]https://www.gov.uk/government/publications/social-housing-decarbonisation-fund-wave-[2]

[9]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/[1036227]/E[02666137]_CP_[388]_Heat_and_Buildings_Elay.pdf

[10]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/[1010366]/eco[4]-consultation.pdf )

# ABOUT RPS

Founded in 1970, RPS is a leading global professional services firm of **5,000** consultants and service providers. Operating in **125** countries, working across seven continents we define, design and manage projects that create shared value to a complex, urbanising and resource-scarce world.

Through our network of offices across the UK we offer a unique and unparalleled range of development and planning services; based upon many years of experience in both the private and public sectors.

For more information about our Planning services visit:
**www.rpsgroup.com/services/planning-and-approvals**

**Or scan here:**

**For more information contact:**


**Jake Tubb**
Senior Planner
**T:** 020 7939 8004
**E:** jake.tubb@rpsgroup.com

**William Emtage**
Associate Director – Sustainable Business & ESG
**T:** 020 7796 5073
**E:** william.emtage@rpsgroup.com