ERRA
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Energy Regulatory Commission
Office of the Energy Regulatory Commission

Session IV:

FACILITATING INNOVATIVE TECHNOLOGIES FOR ENERGY TRANSITION

Lessons from Great Britain on Regulating for the Energy Transition

William Derbyshire

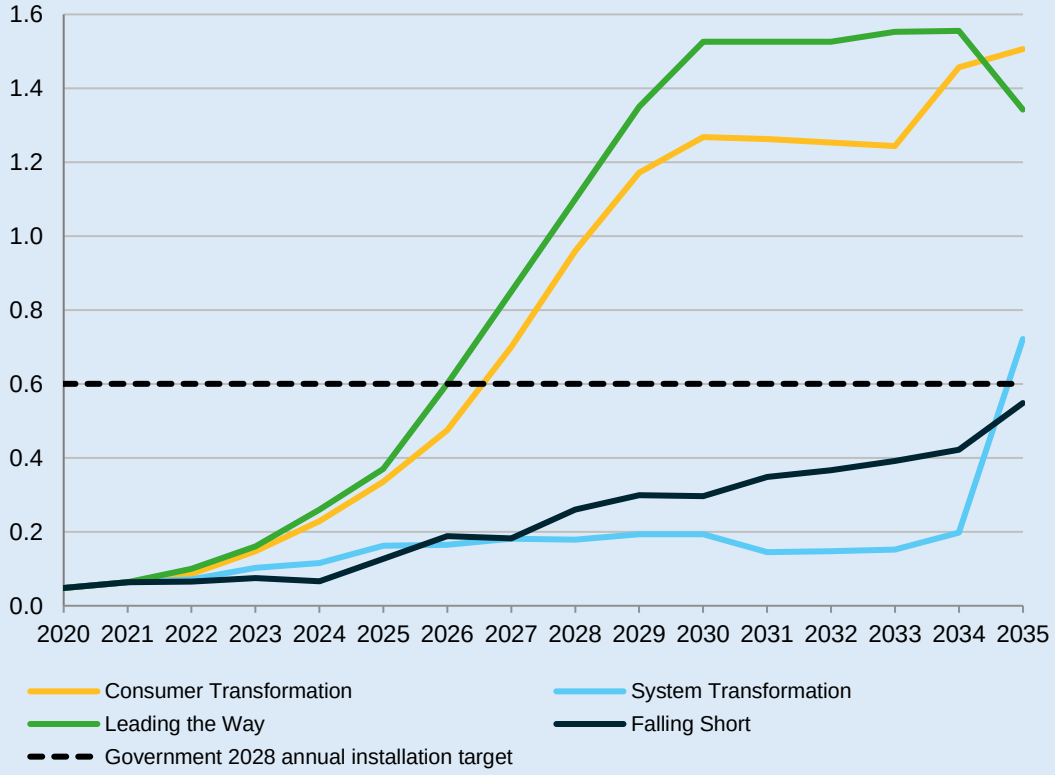
Economic Consulting Associates

The transition in Great Britain and uncertainty

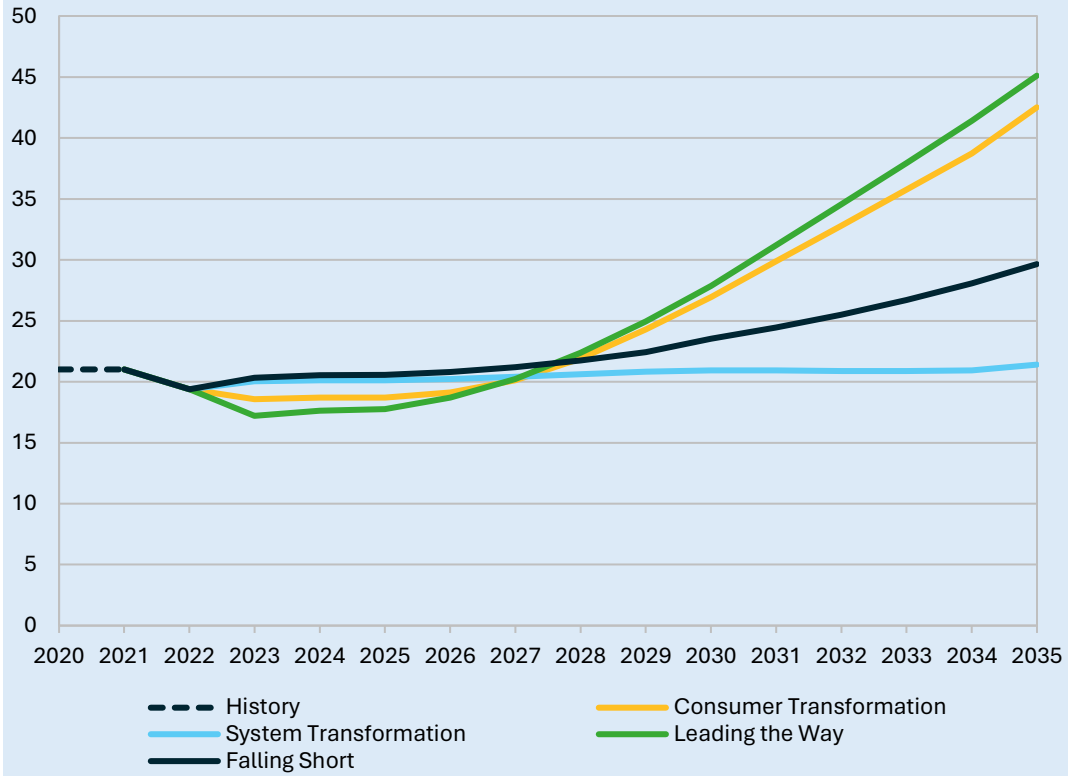
Demand-side example: Electrification of domestic heating

Forecasts for the rate of heat pump installations range from 0.5-1.5 million homes per year. Within 10 years, electricity used for domestic heating is expected to increase anywhere between 0 and 25 TWh

Annual domestic heat pump installations, millions of homes (National Grid ESO, Future Energy Scenarios)



Electricity consumption for domestic heating, TWh (National Grid ESO, Future Energy Scenarios)



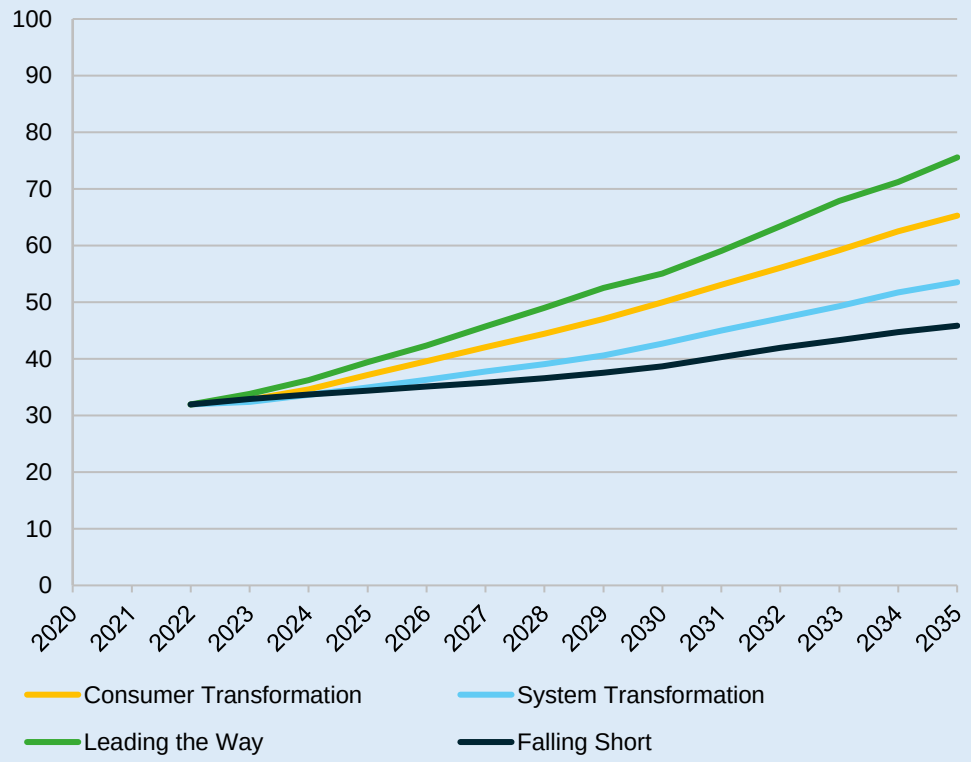
National Grid ESO. 2023. Future Energy Scenarios 2023

The transition in Great Britain and uncertainty

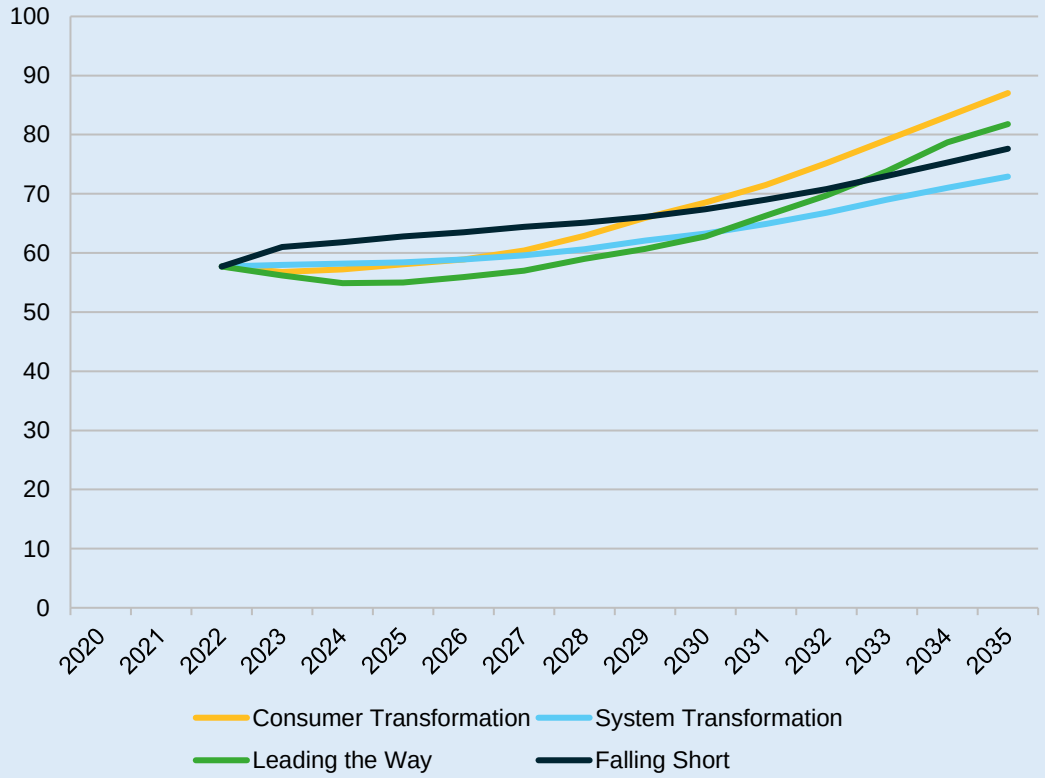
Supply-side example: Distributed generation and peak demand

Distribution-connected generation ranges from 46 to 76 GW by 2035. Electricity peak demand on the grid differs by up to 14 GW or 20% across scenarios.

Distribution-connected generation, GW (National Grid ESO, Future Energy Scenarios)



System peak demand, GW (National Grid ESO, Future Energy Scenarios)



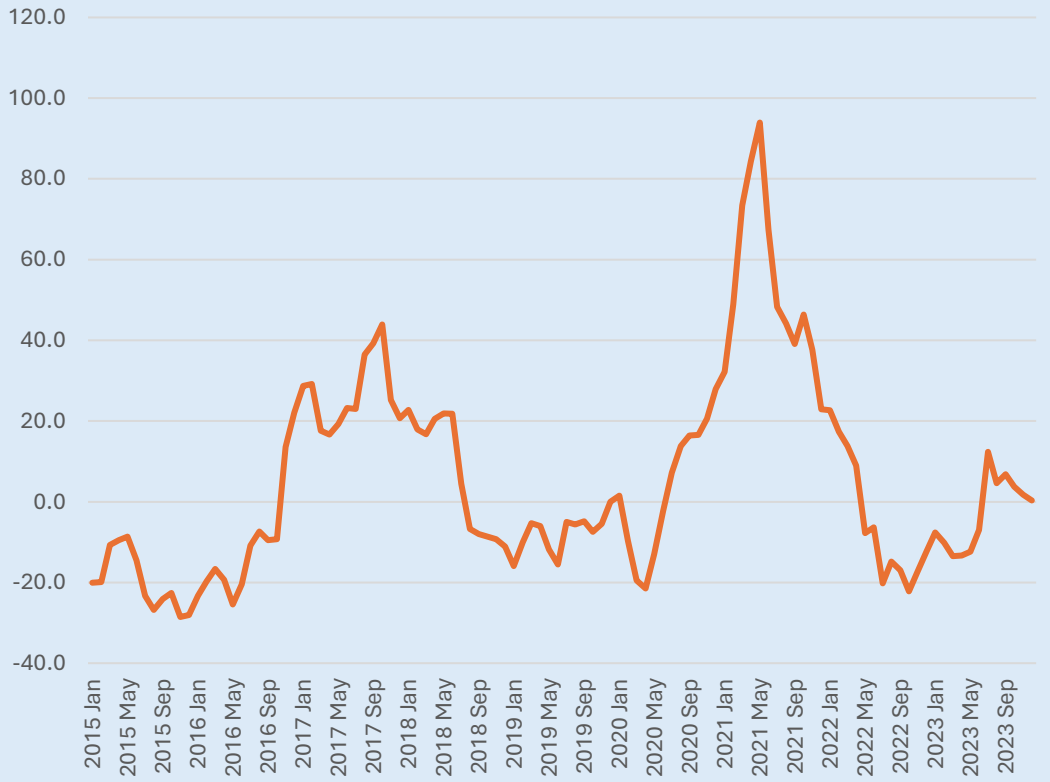
National Grid ESO. 2023. Future Energy Scenarios 2023

The transition in Great Britain and uncertainty

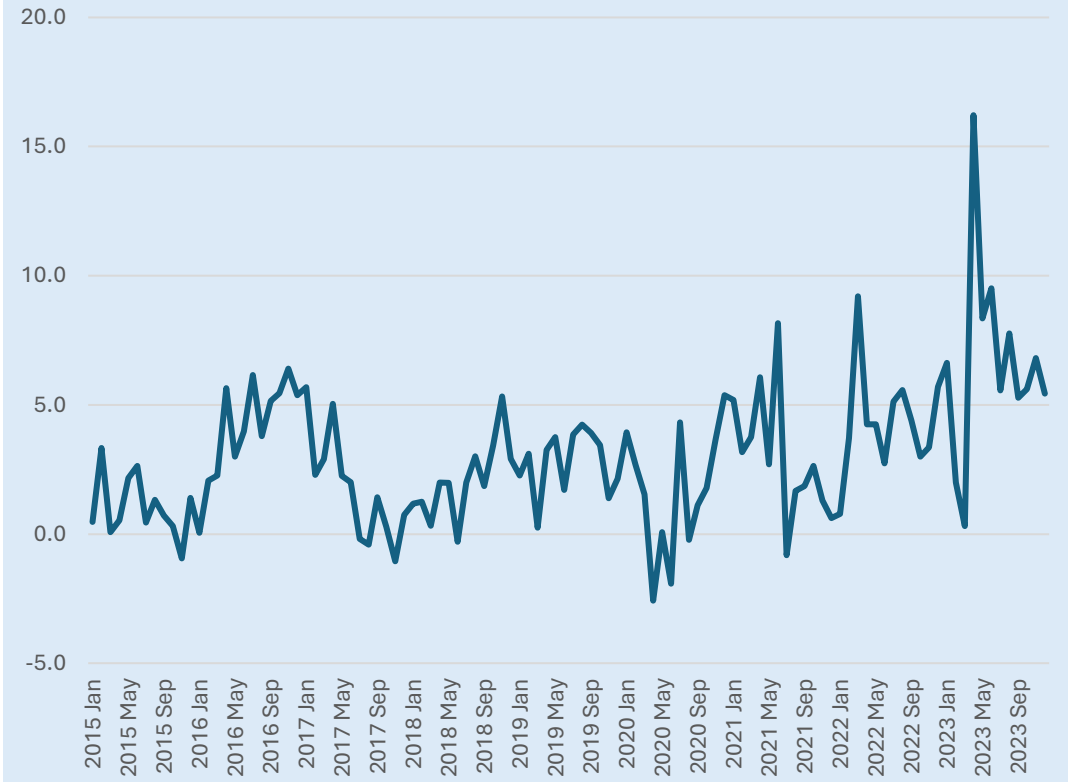
Supply chain example: Materials and labour costs

Costs of materials and labour have become increasingly volatile, meaning indexation to consumer price inflation fails to reflect changes in input costs

Change in copper prices (year-on-year change, %)

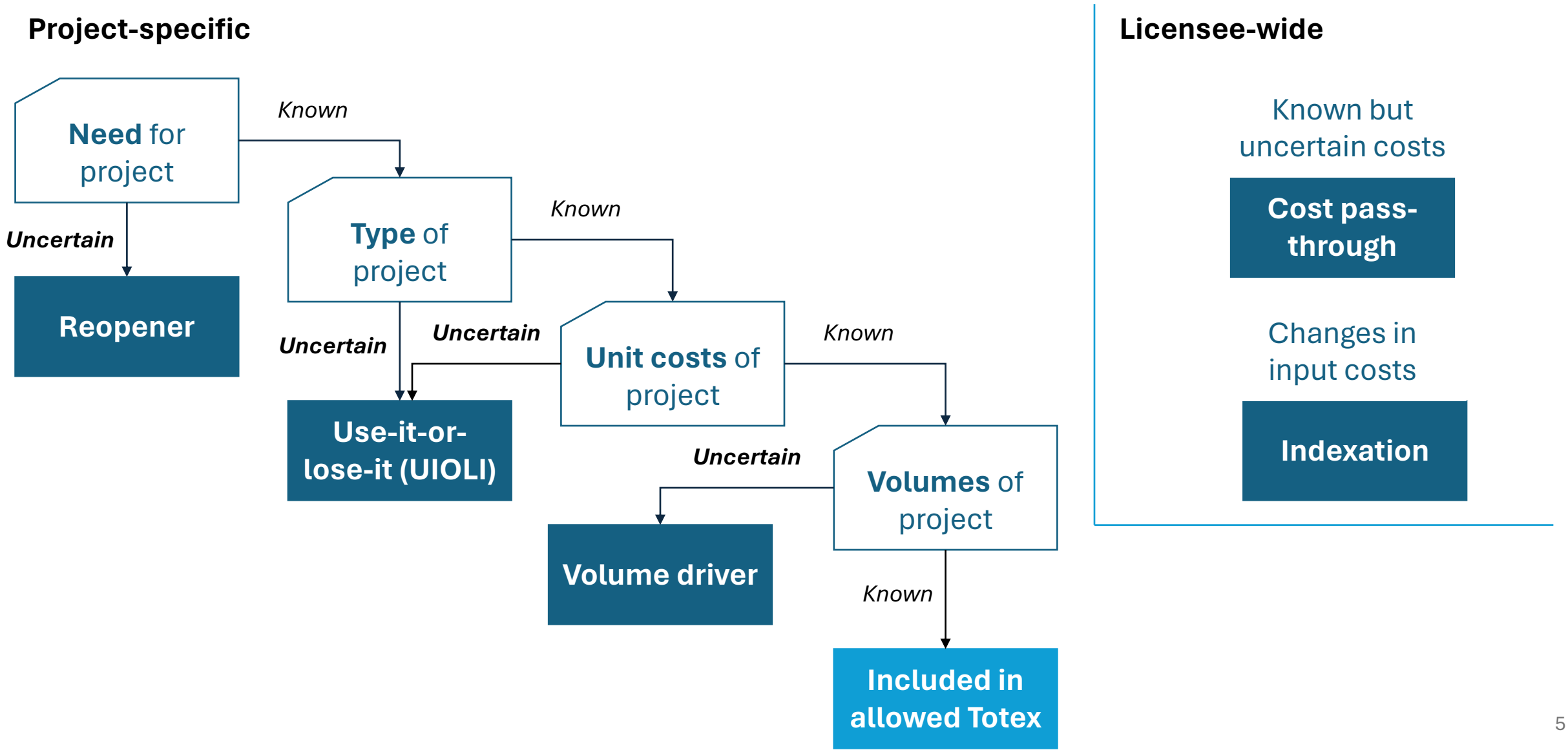


Average weekly earnings growth in electricity, gas, and water supply (year-on-year change, %)



World Bank. May 2024. Commodity Prices | Office of National Statistics. April 2024. Average Weekly Earnings by Industry (EARN03)

Ofgem's mechanisms address needs, costs, and volumes uncertainty



For RIIO-ED2 (2023-28) , a total of 37 uncertainty mechanisms are defined

Reopener		UIOLI	Volume driver	Pass-through	Indexation
Coordinated adjustment	Load-related expenditure	Cyber resilience operational tech	Load-related: LV services	Bad debts	Cost of debt (indexed to trailing average)
Cyber resilience IT	Net Zero	Visual amenity	Load-related: Secondary reinforce	Business rates	Cost of equity (indexed to RFR)
Cyber resilience operational tech	Physical security	Worst-served customers	Polychlorinated Biphenyls	Ofgem licence fees	Regulatory asset value (indexed to CPI)
Digitalisation	Rail electrification		Indirect scaler	Pension deficits repair mechanism	Real price effects (Δ from CPI)
DSO separation	Storm Arwen			Ringfence costs	
Electricity system restoration	Streetwork costs			Severe weather 1-in-20 events	
Environmental	Tax review			Smart meter communications	
High value projects	Wayleaves and diversions			Smart meter IT	
				Supplier of last resort	
				Transmission connection charges	

Net Zero reopener

Purpose	Allow responses to changes arising from new policies (eg, Sixth Carbon Budget)
Reopener window	Any time
Trigger	By Ofgem, on the advice of Net Zero Advisory Group (*)
Materiality threshold	Change >0.5% of annual average base revenues

The Net Zero reopener mechanism allows within-period adjustments to allowed revenues to respond to changing policies

By their nature, the nature, size, and costs of such changes are not known in advance. Therefore, they are addressed through a specific review of changes proposed by DNOs, once a reopener is triggered by Ofgem

(*) Members are: Ofgem | Treasury | Department for Transport | Officer for Zero Emissions Vehicles | Scottish Government | Welsh Government | National Infrastructure Commission | Climate Change Committee | Citizens Advice

Managing the reopener process

Ofgem is very aware of the risk of being 'swamped' by reopener proposals. To avoid this, it imposes various restrictions on when a reopener can be requested, and adjusts the review process to the scale of the proposed changes

Application windows	**Limited to one week January of each year for DNO-triggered reopeners (with some exceptions)** **Any time for Ofgem-triggered reopeners**			
Pre-application engagement	DNOs should engage with Ofgem at least three months prior to application, to check eligibility and identify major issues			
Format of applications	Must include cost-benefit analysis and engineering justification paper, following templates specified by Ofgem			
Assessment processes graded by significance		**Fast track**	**Standard**	**Additional scrutiny**
	Multiple of materiality threshold	< 1.5x	1.5x – 5x	> 5x
	Policy issues	No	Optional	Optional
	Estimated time to decision	< 3 months	3 – 6 months	> 6 months

Worst-served customers UIOLI

Purpose	Provide a specific ex-ante allowance to be used only for improving supply quality to worst-served customers (WSC)
Ex-ante allowance	Proposed by DNOs and set by Ofgem as part of ED2 review (ranges from £0-21 million per DNO)
Reporting and monitoring	Annual reporting of: WSC numbers / schemes in year / progress of schemes / number of benefitting WSC / final cost per scheme
UIOLI adjustments	Claw-back unspent allowances

The mechanism is intended to ensure that incentives to improve average supply quality do not lead to the worst-served customers (WSC) being ignored

WSC are defined as those customers experiencing 12+ interruptions to their supply over three years (with a minimum of three interruptions in each year)

The ED2 mechanism addresses some of the reasons for underspending in previous control periods, by making the WSC definition looser and by not requiring ex-post proof of benefits (now the DNO only needs to show that the scheme is intended to improve quality for WSC)

LV networks secondary reinforcement volume driver

Purpose	Enable additional investment in LV networks to meet net zero requirements (eg, DG and EV)
Volume drivers	*Substations*: MVA additions *Circuits*: km additions by type (HV or LV and OHL or UGC) *Flexibility*: Deferred substation (MVA) and circuits (km) additions
Unit costs	Median proposed rates (£/MVA and £/km), adjusted for DNO-specific labour costs
Allowance	Ex-ante allowance set on forecasts and adjusted up or down to match actual volumes

Ofgem imposes controls, to prevent abuse of the volume driver. An overall cap on expenditure under the driver is applied, and the DNO must comply with specific metrics

Transformer utilisation	Investment should only be within areas of high utilisation	Transformer utilisation >100% of rated capacity
Transformer capacity released ratio and circuit lengths added ratio	Additions are proportional to demand growth	*Δ capacity / Δ low carbon technology demand* ≥ industry benchmark (*)
Peak demand and energy growth indices	Investment responds to sustained growth in demand	Year-on-year growth in areas of investment is positive
Flexibility procured transformer utilisation	Flexibility is only procured to avoid transformer investment	Transformer utilisation before flexibility >100% of rated capacity

(*) LCT include heat pumps, EVs, and distributed generation. The benchmark is derived from modelled reinforcement requirements relative to forecast LCT expansion.

The potential downsides of uncertainty mechanisms

Concerns have been raised that Ofgem's focus on uncertainty mechanisms means that it avoids it committing to anticipatory investments and long lead-time investments, thereby increasing risks to investors and costs to utilities

> "I think I can characterise the relationship, or the perception, of the regulator, particularly Ofgem, with private investors having been a little strained. Their frustration is the balance of the desire and messaging of investing in the long term into such utilities and how that plays fundamentally, against the regulatory settlements that Ofgem has put in place. One can accurately identify that there has been a degree of a strained relationship." Darryl Murphy (Head of Infrastructure at Aviva Investors)

> "Undoubtedly, there has been a shift from what used to be ex ante price regulation for seven years to, essentially, rolling price reviews that, in the words of one of my clients, never end. You are constantly in discussion with the regulator, which I think remains to be seen; can it secure the investment we need for net zero?" Simon Virley (Head of Energy and Natural Resources at KPMG)

House of Lords | Industry and Regulators Committee. 16 November 2021. Ofgem and net zero - Oral Evidence

Key messages

1. The size and costs of investments required by the energy transition are very uncertain, given policy changes and uncertainty over the speed of customer take-up

2. Ofgem is among the leading regulators in developing mechanisms to manage these uncertainties, with each mechanism responding to the driver of uncertainty

3. Care needs to be taken to avoid overwhelming the regulator and to retain incentives over those aspects under the utility's control (eg, unit costs)

4. There are also risks, including delaying investments and increasing the complexity of regulatory systems

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15 - 17 MAY 2024 | Bangkok, Thailand

Thank You

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