

Europe Power Market Review 2022

A disruptive series of macro events in 2022 has had a profound impact on the energy market that will be felt for many years to come.

How the year began: optimism and progress

The start of 2022 saw growing optimism, post-Covid, with positive economic and political conditions. The energy transition looked on a stable path, with broad commitment despite the shock of the pandemic.



Global Cooperation

China and the US agree to boost climate cooperation.

Agreement to strengthen emissions targets to 2030.



The end of coal?

COP agree action on “phasing down” of coal – rather than phase “out”.

Failure to commit to phase-out of “fossil fuel subsidies”.



Economic Bounce Back

The economic restrictions imposed by the pandemic are being removed.

Strong economic rebound by surplus savings and major fiscal and monetary stimulus.



Climate Action

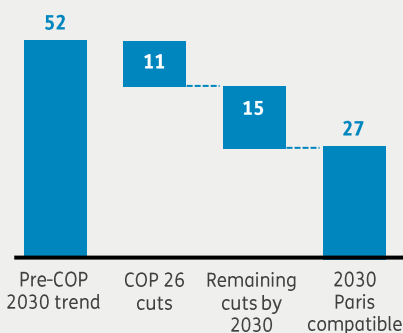
Public consciousness of climate related issues continued to rise, amidst political and activist campaigns, as well as COP 26.



Investor Pressure

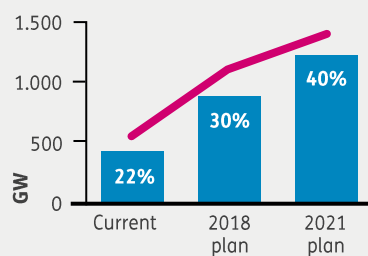
ESG and wider stakeholder capitalism agenda drove increasing investor activism with capital deployed to green technologies.

COP 26 Success (Gt CO2)



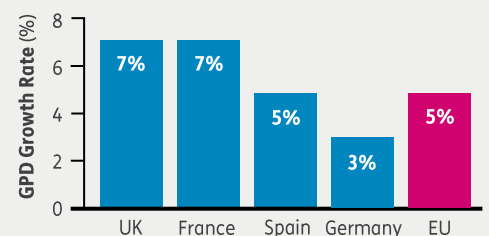
Source: Climate Action Tracker

EU upgrades renewable 2030 targets



Source: EU Commission

Strong economic rebound 2021



Source: World Bank

A year of disruption and volatility

A series of economic and political shocks have altered the macro environment markedly.

Key macro events of 2022

Hot initial recovery	China lockdowns	Superpower rivalry	Ukraine invasion	Fragmented global action	Tight gas markets
Economies run hot with strong pent-up demand being released after the pandemic.	China instigates an aggressive “Zero Covid” policy which prolongs the economic disruption in the country by maintaining regional lockdowns.	Increasing tensions between the US and China accelerate competition for critical materials and technology, such as microchips and rare earths.	The Russian invasion of Ukraine creates uncertainty over the supply of Russian gas to Europe and is followed by profound real cuts.	Global coordination in response to the invasion is weak. Western countries pursue aggressive sanctions, whilst India, China and others opt out.	Reductions in Russian gas volumes to Europe and a scramble for supplies contribute to record high wholesale prices in Europe.

Economic consequences



Commodity markets spike

TTF Gas Futures
€109/MWh (Nov 22)
€65/MWh (Nov 21)



Power prices spike

Wholesale average price (DE)
€76/MWh (Jan-Oct 21)
€241/MWh (Jan-Oct 22)



Inflation accelerates

Eurozone Inflation
10.7% (Oct 22) vs
4.1% (Oct 21)



Interest rates rise

ECB Rate
1.5% (Oct 22) vs
-0.5% (Oct 21)



Growth outlook weakens

EU GDP growth at
3.3% (Nov 22) vs
5.3% (Nov 21)



Supply chain costs increase

Polysilicon prices
\$37.5/kg (Oct 22) vs
\$29.5/kg (Oct 21)



Markets fragment

Benchmarks diverge between sanctioned and non-sanctioned

Policy consequences

Energy becomes more strategic for governments

Energy moves up the domestic agenda

Governments intervene in markets

Reallocation of political focus and economic resources towards energy

We see five main consequences for the power sector 2022-2030

Baringa's end of year European power market review compares our central outlook in Q4 2021 with that of Q4 2022. The changes identified are significant, owing to the seismic impact of the war in Ukraine. We group the changes identified into five categories:

1



Higher and more variable wholesale power prices

Wholesale prices **significantly increase**, remaining above pre-crisis levels out until 2030.

2



Greater government interventions

High wholesale prices have **stimulated greater government intervention** in both wholesale and retail markets.

3



Accelerated transition

Europe pursues an accelerated transition, **increasing its 2030 renewable capacity by 15%**, advancing the transition.

4



Emissions Outlook

Short-term coal use leads to **significant increase in emissions** which will not be mitigated by accelerated renewable deployment until post-2030.

5



Generator profitability

Significant change to capture price outlooks, LCOEs and spark spreads contribute to greater profitability outlook for power generators.

1



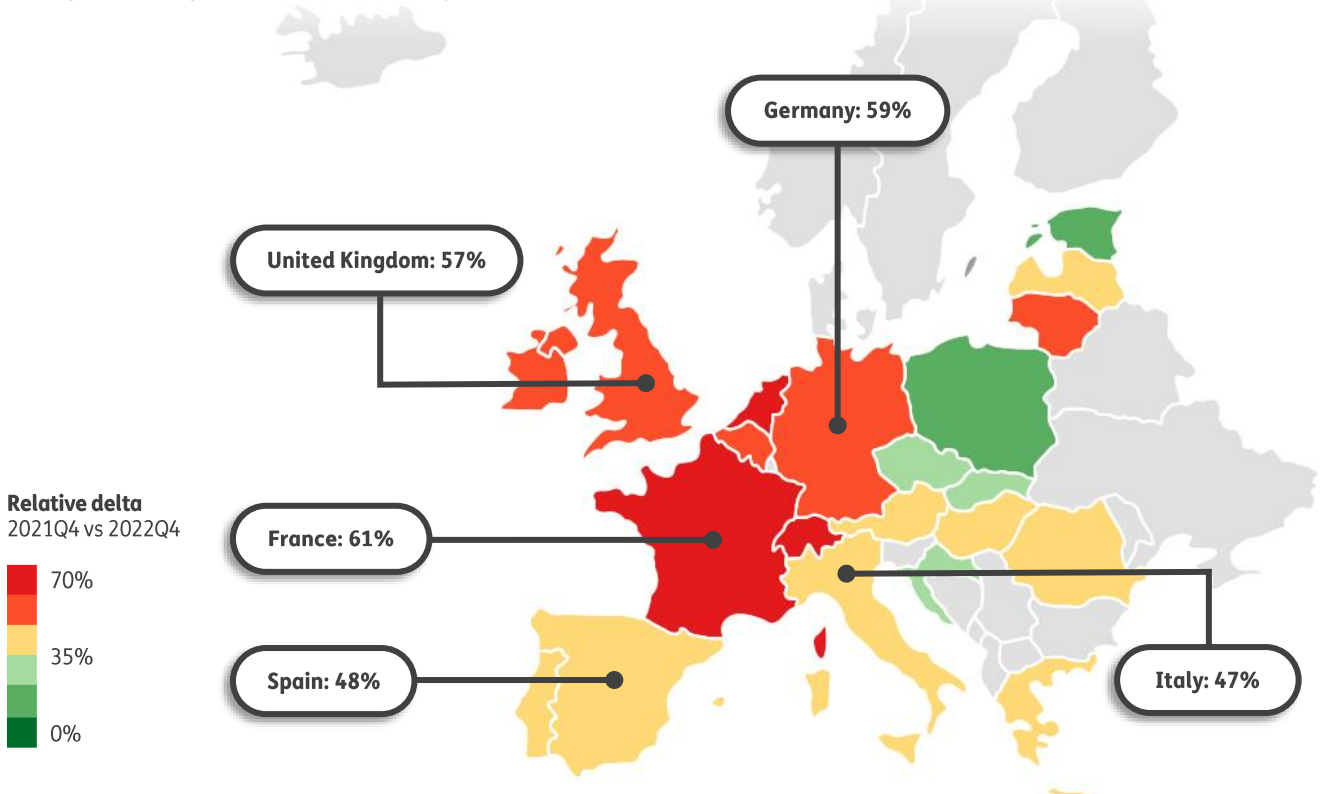
Higher and more variable wholesale power prices

Average cumulative wholesale price 2023-2030 is 46% higher than pre-conflict projections

Noticeable variation between east and west Europe on account of the differing role of gas and ease of alternatives, e.g. coal.

The implications of the weaponisation of gas flows into Europe by Russia have had dramatic short-term ramifications on both gas availability and wholesale power prices owing to its role in the merit order. Whilst we expect to see both wholesale gas and power prices fall from the extraordinary levels experienced in 2022, a complete reversion to our previous outlook will not be achieved by 2030.

Change in Baringa cumulative cost projections 2023-30



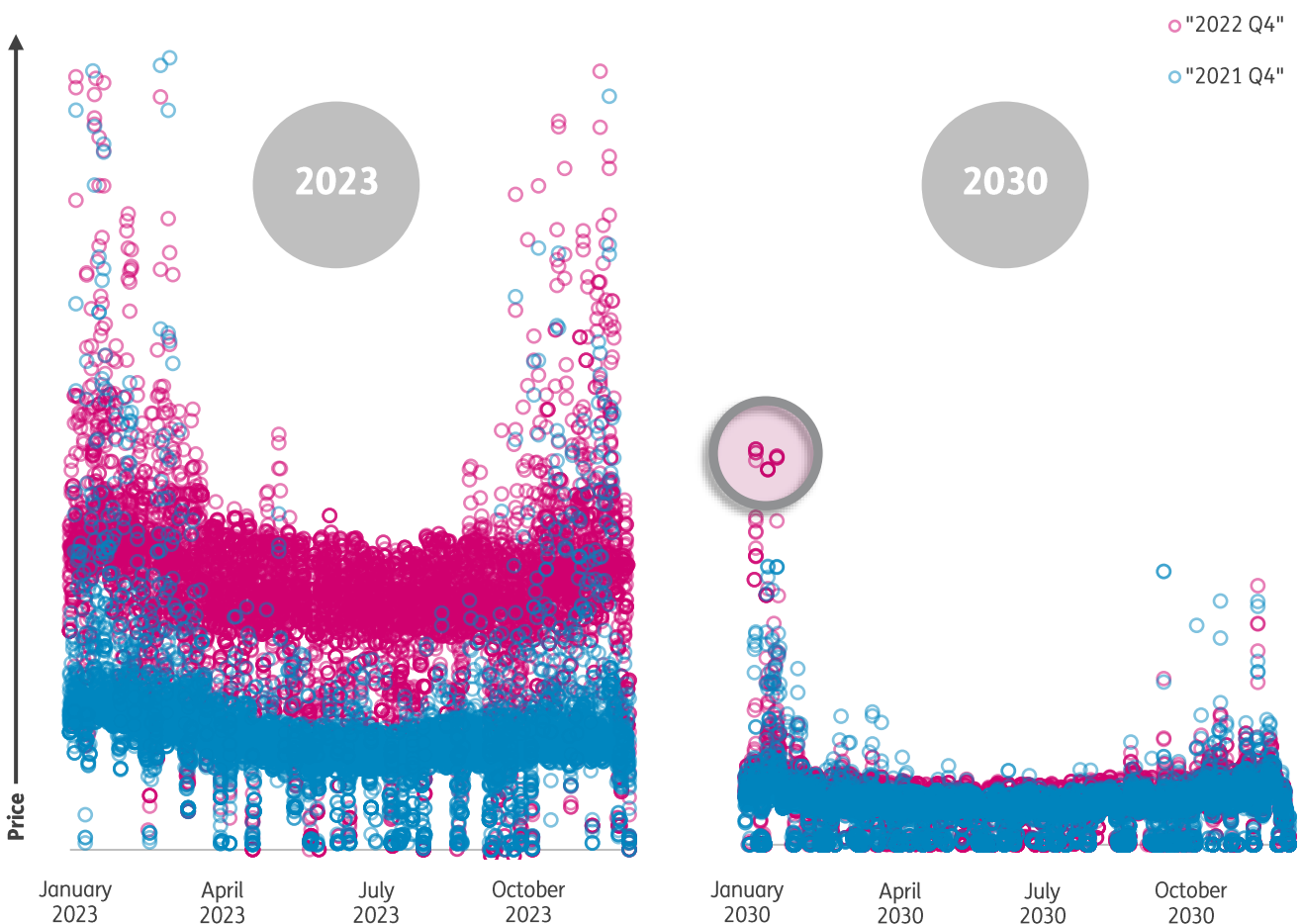
▶ Across Europe, ~€990bn more will be spent on power in 2023-30.

Wholesale prices show higher frequency of extreme prices out until 2030

Daily wholesale prices suffer both extreme price elevation and volatility most notably in the short-term but continue to show signs out until 2030.

Wholesale power prices have seen both an extraordinary increase in prices but also frequency of extreme price events relative to the mean. In 2023 we expect this to continue. Even in 2030, when wholesale prices have fallen considerably, prices remain above our Q4 2021 outlook and signs of more frequent extreme price events remain, although far diminished.

Hourly wholesale prices in an example European country 2023 and 2030 (2021 view vs 2022 view)



▶ *Even in 2030, there are 10 hours which exceed the Q4 2021 highest projected price event.*

2



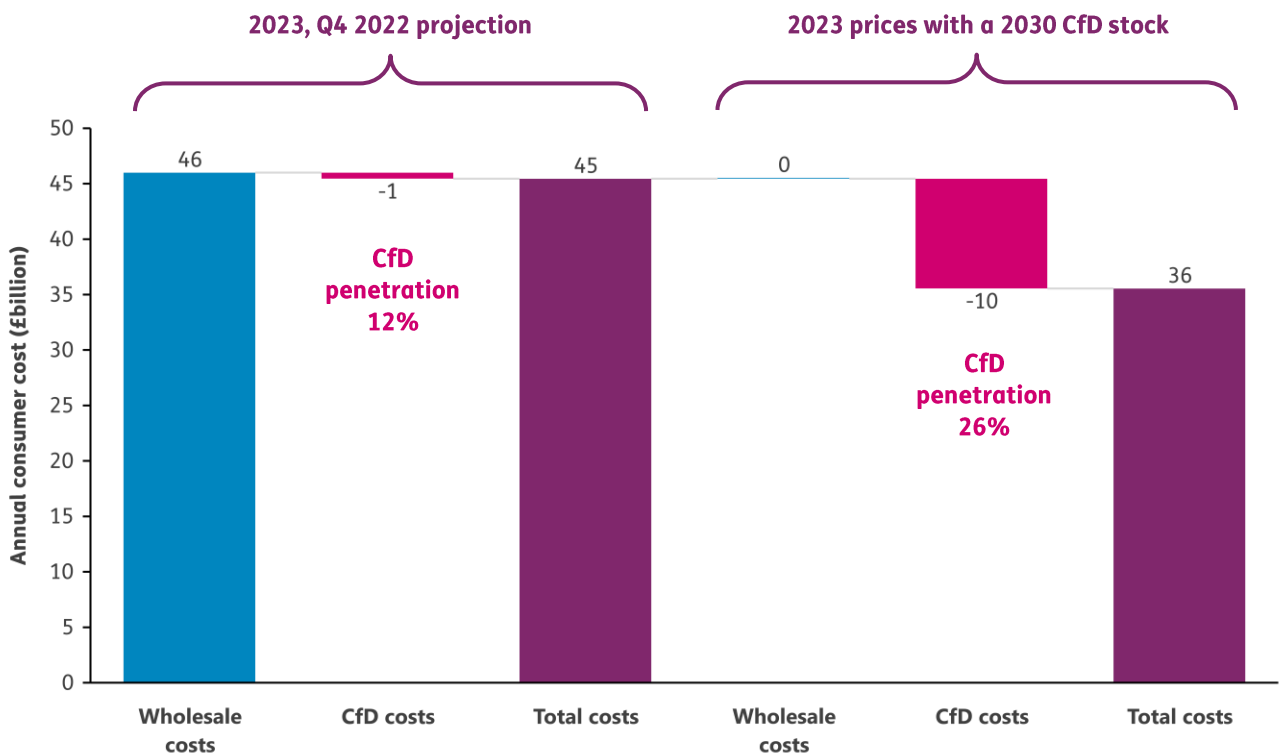
Greater government interventions

Despite prices, CfD net payments to government are just £1bn due to low CfD penetration

CfD penetration as a % of total generation is just 12% in 2023, delivering little protection for the consumer. Under 2030 projections, a CfD penetration of 45% would have saved c.£10bn.

The saving of CfD use has been limited by the low CfD penetration in many European power markets. We estimate that under our current price outlook for the UK, the current CfD penetration would amount to a saving of just c.£1bn relative to merchant. In a hypothetical world where the 2023 price outlook was to occur in 2030, the higher CfD usage and lower strike price would have saved c.10bn.

Wholesale electricity price impacts on GB electricity spend



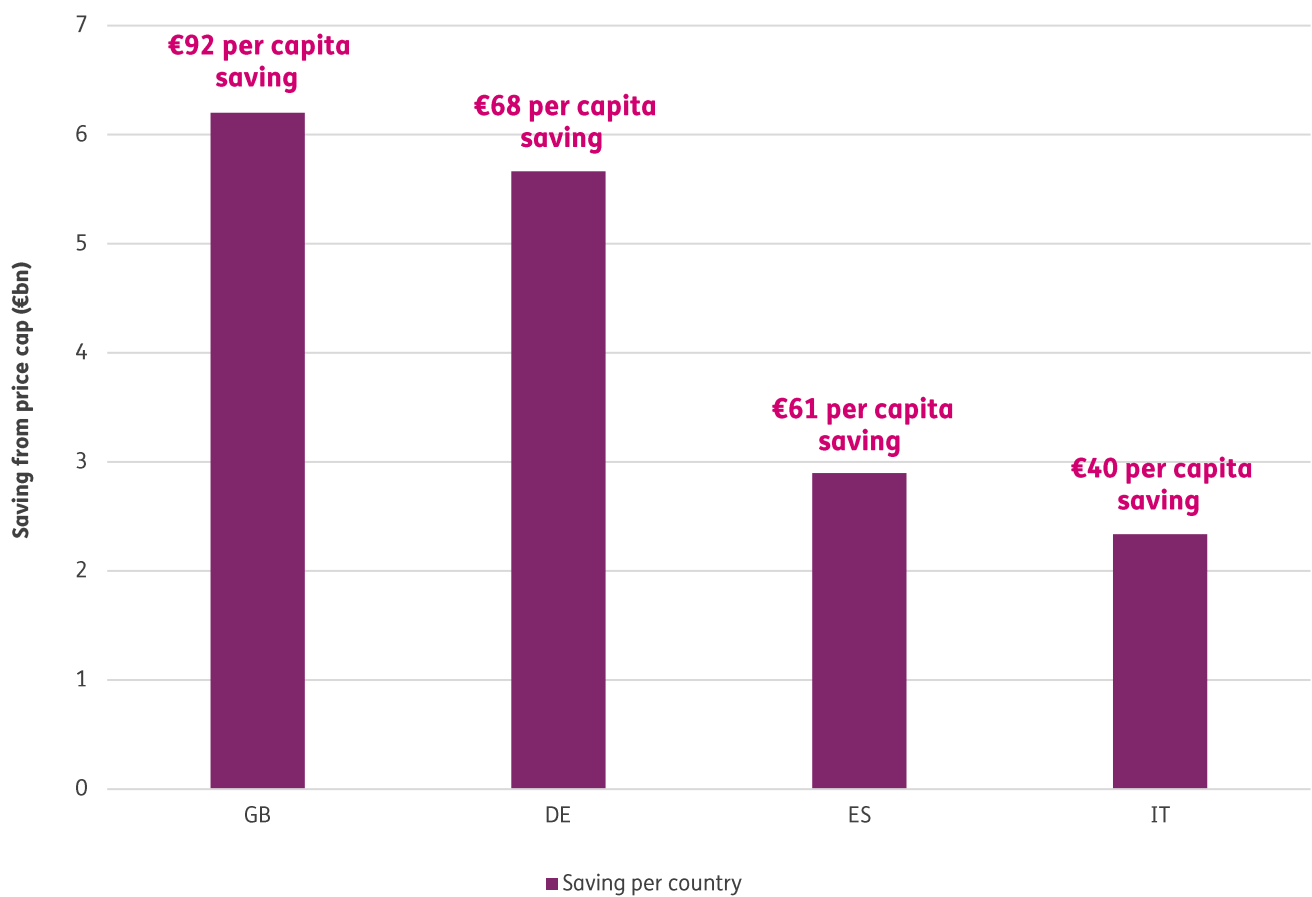
In the new higher-priced world, CfDs pay back to consumers, but in 2023 the CfD stock is low and strike prices high, so the net effect per year is small.

Equivalent high prices in 2030 would see consumers well protected by the CfD, as a greater proportion of generation would be covered, and at a lower strike price.

Price caps will reduce costs on average by €4.5bn in 2023

Owing to insufficient CfD protection, price caps are being introduced across Europe to protect consumers. These will significantly reduce the impact of higher costs, but energy bills will still be much higher than previously expected.

2023 Saving from revenue caps in major European markets



▶ UK has highest savings per capita at €92;
Italy has the lowest savings per capita at €40



Accelerated transition

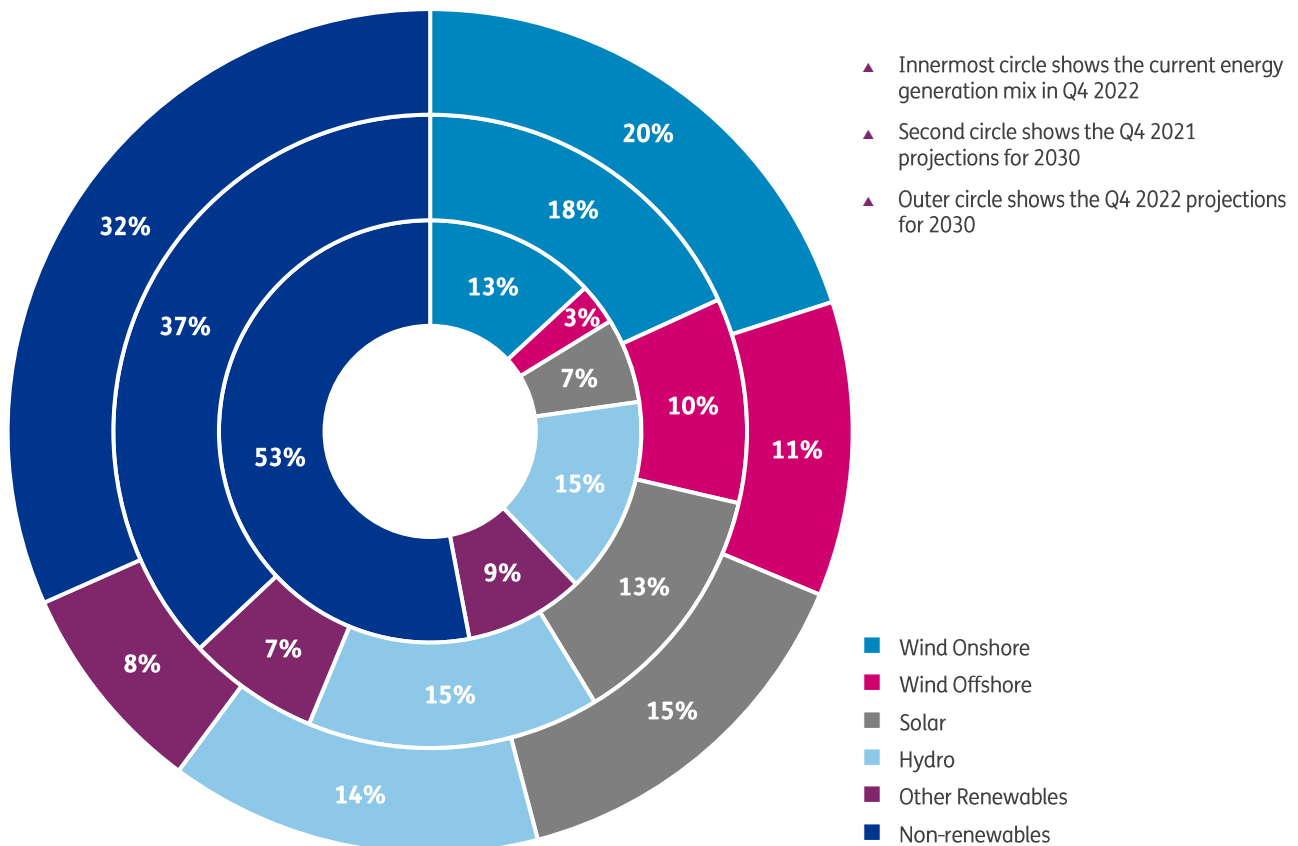
Renewables represent 68% of 2030 generation mix, up by 300TWh from initial forecast

Renewables predicted to comprise a larger share of the energy mix than previously modelled and vice versa for non-renewables.

Europe sees a profound shift to renewables as multiple European markets are set to accelerate their energy transition as a response to the energy security challenges brought by the invasion of Ukraine.

Our new central outlook sees non-renewable generation fall to less than 1/3 of total generation by 2030.

Baringa's European Change in energy generation mix projections 2030



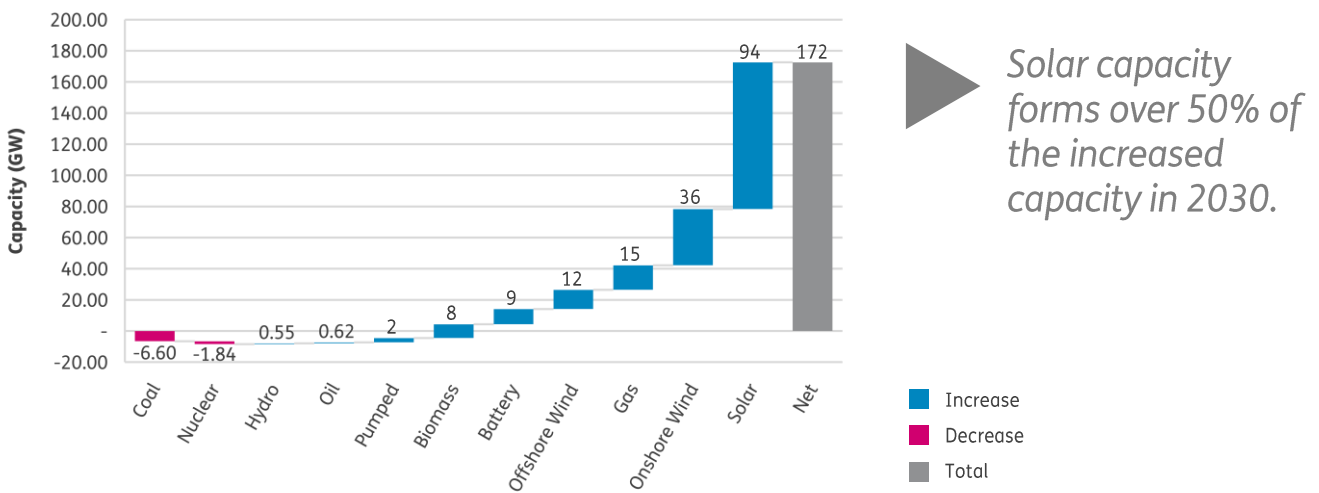
▶ *Non-renewable generation projected to shrink to less than a third of Europe's power.*

2030 net capacity increases as renewables soar, led by solar

Significant growth in net installed capacity, as intermittent renewables require greater capacity to generate Europe’s energy than some of the ‘always-on’ capacity that is being retired, such as coal and nuclear.

Most of the upgrade in renewable deployment is set to come from solar and onshore wind which can be deployed at far greater speed than many renewable alternatives.

Change in capacity mix projections 2030

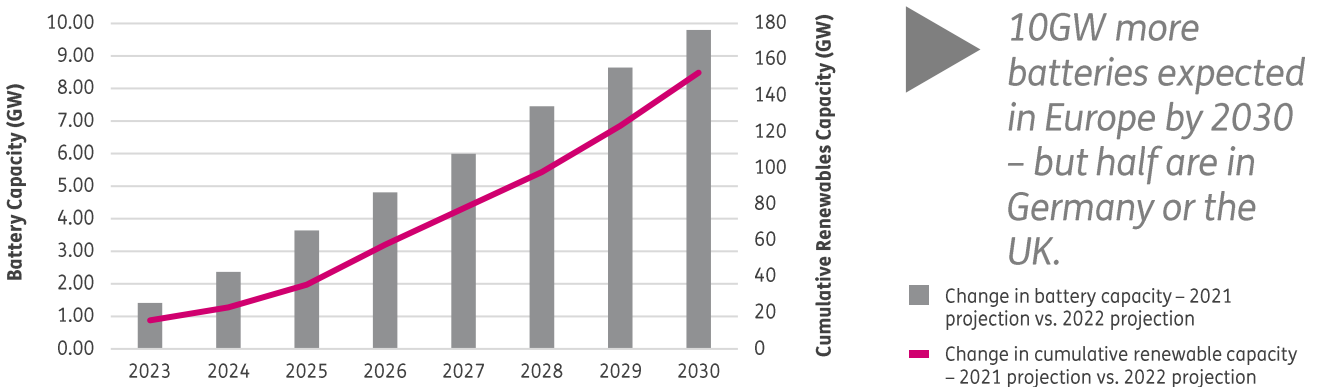


Battery capacity rises along with renewables to provide flexibility

Battery storage increases, although the pace of growth may be slightly slower than that of renewables

The acceleration in renewable ambition is set to stimulate the need for far greater storage capacity. European battery capacity is set to rise by more than 10GW relative to our 2021 outlook.

Change in projections of battery capacity and cumulative renewables capacity 2023-2030

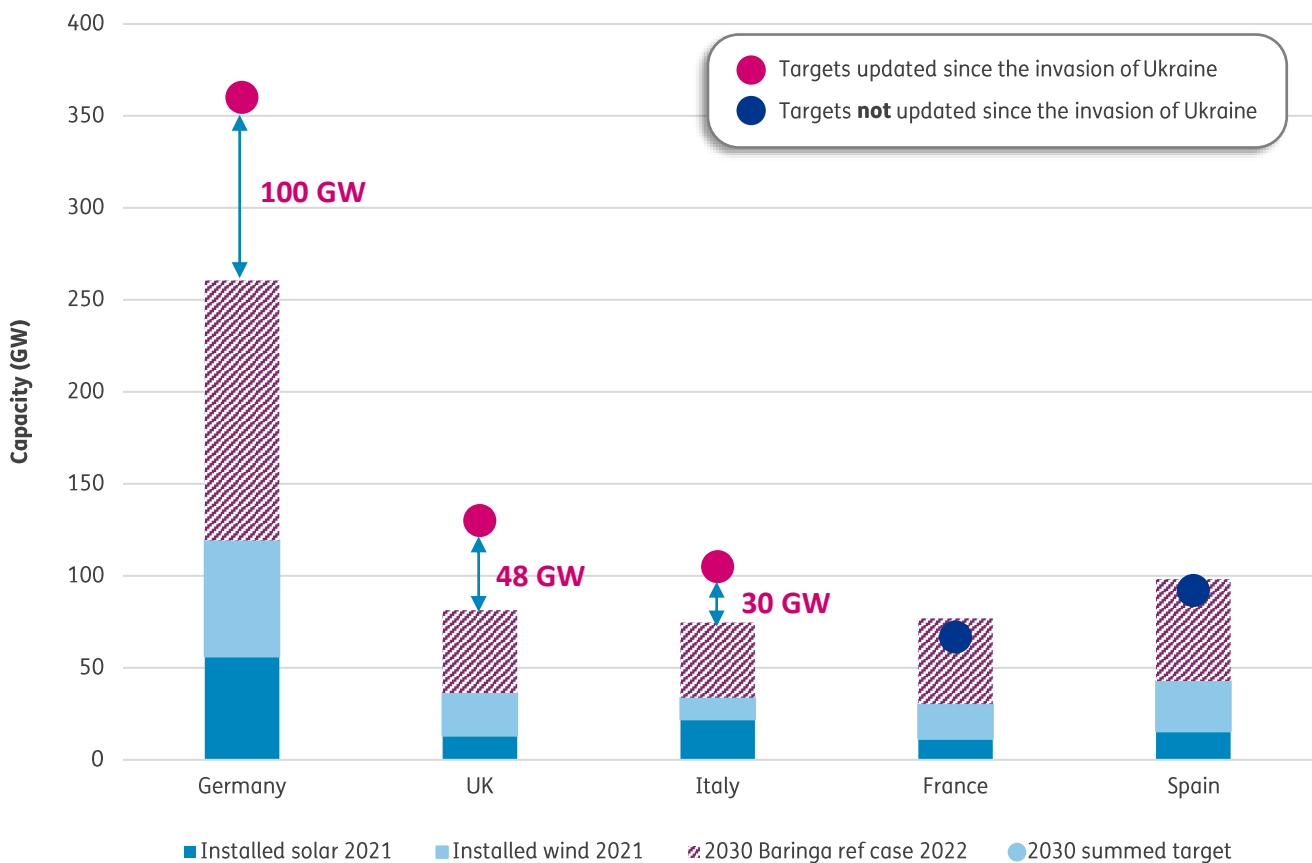


Renewable targets at risk of being missed

Significant aspiration gap between current pipeline deliverable by 2030 and government targets, owing to supply chain and operational delivery constraints creating a challenge for policy-makers and developers alike.

Despite the significant upgrade in renewable ambition in countries such as Germany and the UK, our central outlook for RES deployment by 2030 falls short of upgraded targets. We refer to this as an “aspiration gap.” This is the delta between the realistic deployment rate by 2030, considering the current pipeline and policy environment, and stated government ambition.

2030 Aspiration Gap (2030 target vs Baringa Ref Case projections) across selected European markets



► Cumulative aspiration gap likely to exceed 125GW of capacity for markets shown.

4



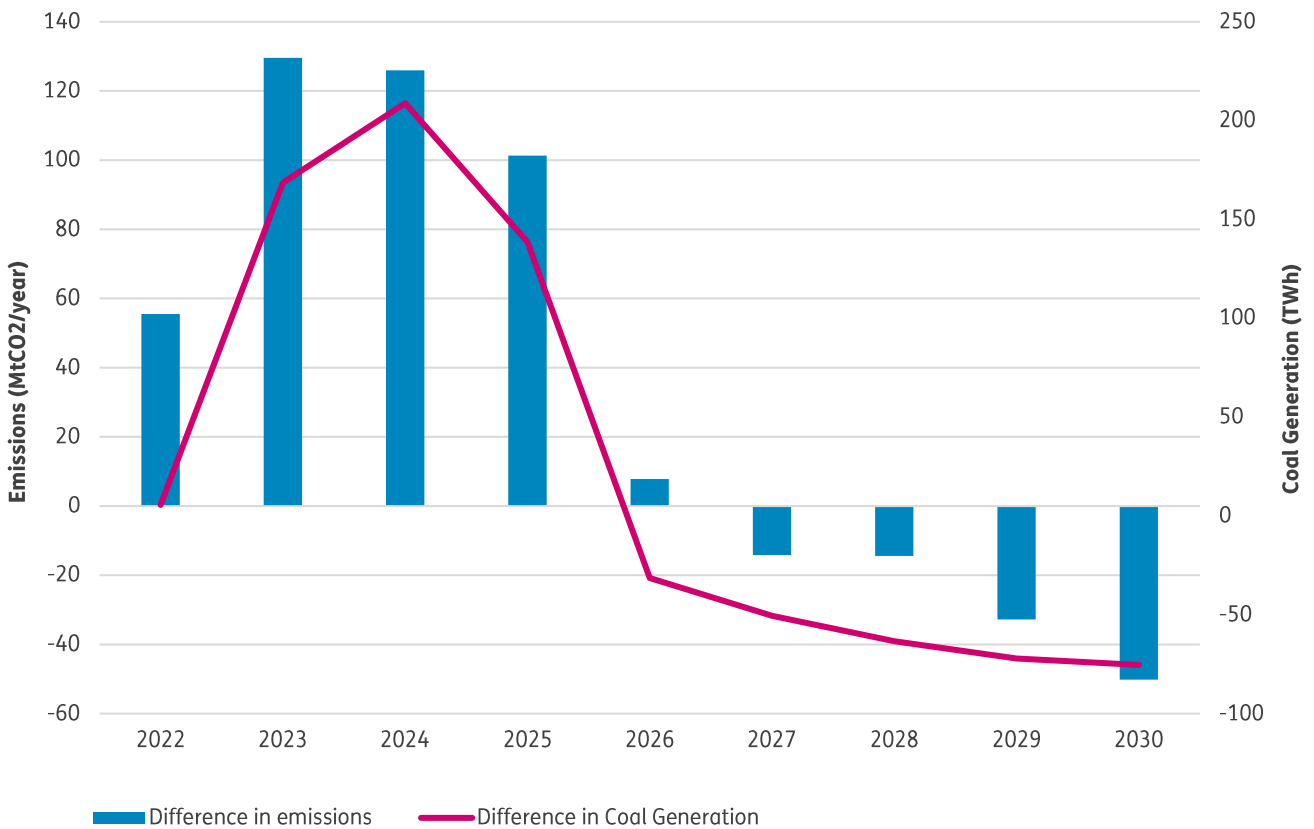
Emissions Outlook

Short term coal use drives up total cumulative emissions 10% by 2030

Coal generation exceeds pre-crisis trajectory out until 2025 before turning negative. However, cumulative emissions to 2030 remain above pre-crisis levels.

Shortages of gas into Europe is expected to drive a significant increase in coal use relative to our 2021 outlook. Coal use remains above our pre-crisis outlook until 2025. As a consequence, power emissions will be higher than they otherwise would have been every year until 2025.

Change in projection of emissions and coal generation 2022-2030



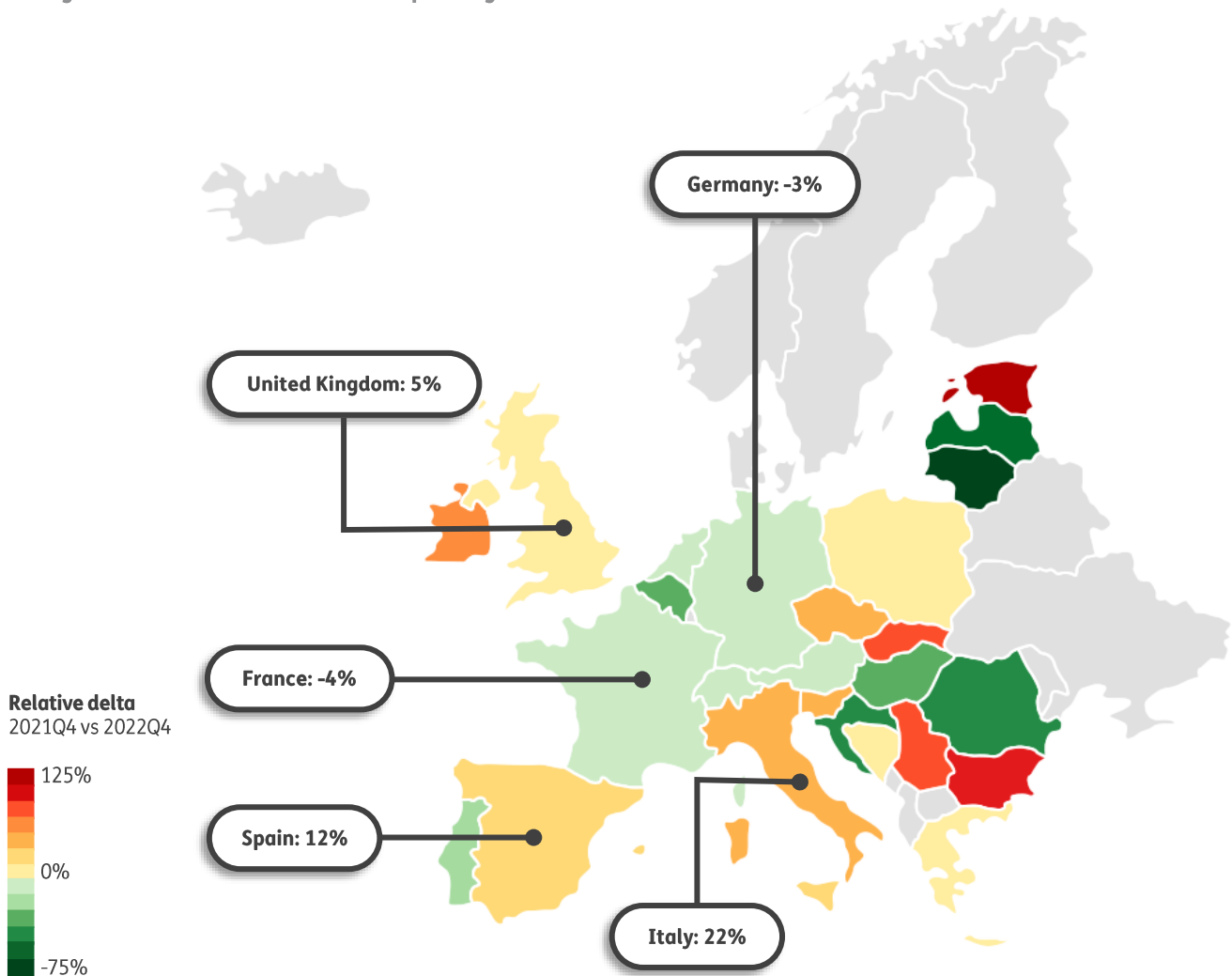
▶ Coal generation 2022-30 up ~307 TWh; emissions up ~300 MtCO2.

Cumulative emissions exceed pre-crisis trajectories in many countries in western Europe

An accelerated transition compensates for greater coal use in many eastern European markets.

Cumulative emissions out to 2030 are 10% higher than our 2021 projection across Europe. Although, significant variation between states exists owing to the different starting positions of the country's energy mixes.

Change in cumulative emissions from power generation 2023-2030 MtCO2



▶ Europe experiences an average increase of 10% in CO2 emissions across 2023 – 2030 in PowerGen.

5



Generator profitability

Higher profits for RES deployed post Ukraine owing to higher capture price

Increased capture price across renewable technologies fuels profit growth. Solar development costs increase, owing to supply chain constraints, leading to smaller profit gains relative to onshore wind technology.

Higher wholesale prices are expected to provide a sizeable increase in profitability for generators across Europe. Whilst LCOEs are forecasted to be higher in most markets, especially for solar, higher capture prices nevertheless drive an increase in expected profitability.

Change in expected NPV (%) of renewables projects according to Baringa modelling (Q4 2022 vs Q4 2021)*



* Based on theoretical 25-year lifetime merchant renewables projects completed in 2021 and 2022, with first generation in 2022 and 2023 respectively.

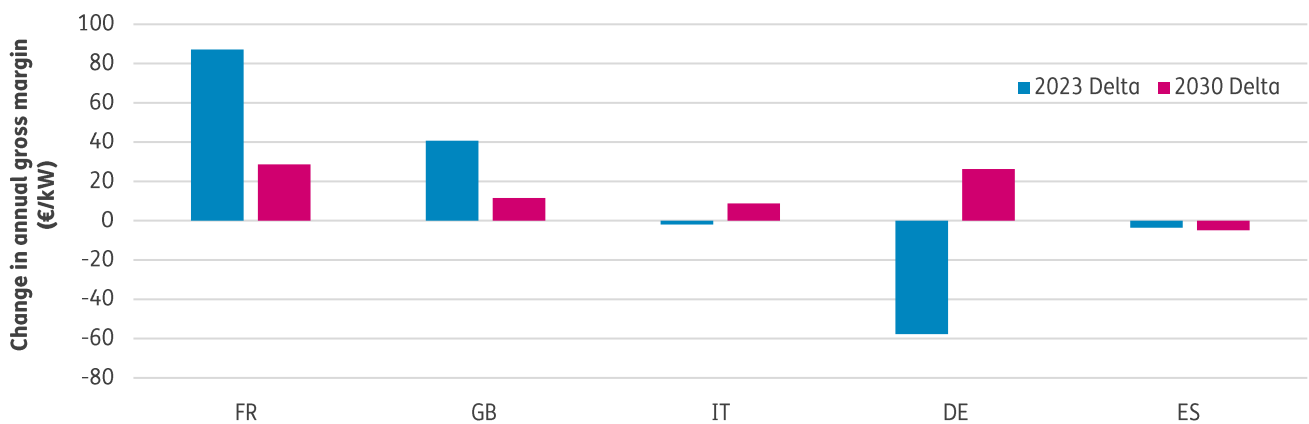
▶ Onshore wind profits increase twice as much as solar profits.

Gas plant profits across Europe diverge due to domestic mix and policy

France’s short-term increase owes to nuclear constraints, whereas Germany’s short-term decrease is a result of increased use of coal. Stability in the form of interconnectors protects Spain and Italy from significant shift as well as gas caps.

Increased use of less efficient gas plants and rising scarcity premiums due to power shortages is expected to see gas generator profits rise in certain markets.

Change in gas plant profits for 2023 and 2030, 2021Q4 vs 2022Q4



▶ On average gas profits are €14/kW higher than previous projections.

If you are interested in hearing more, please get in touch with our experts.



Ilesh Patel
Partner and Lead, Global Energy Perspectives Team

Ilesh.Patel@baringa.com



Caspian Conran
Political Economist, Global Energy Perspectives Team

Caspian.Conran@baringa.com

Find out more:

www.baringa.com

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