

SPEECH

Europe's road to renewables

Speech by Christine Lagarde, President of the ECB, at Norges Bank's Climate Conference in Oslo, Norway

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It is a pleasure to be at Norges Bank again.

When I last visited the central bank, back in the summer of 2016, the world – and Europe – were in a very different place.

The Paris Agreement, the international treaty to reduce greenhouse gas emissions, was not yet one year old, and still enjoyed strong support among all major powers.

A benign geopolitical environment also blurred the risks of Europe's growing energy dependencies. Nord Stream-2, a new gas pipeline project, had recently been announced, promising to deliver cheap Russian gas to the continent.

Since then, our world has changed dramatically.

We are witnessing a growing denial of the climate crisis and a backlash against green initiatives. The war in Ukraine further exposed Europe's energy dependencies as strategic vulnerabilities, driving up gas prices after the cut-off of the Russian pipeline supply.

As a result, energy prices have risen sharply, since gas remains the marginal price setter in the EU energy market for most of the time. This has weighed heavily on the competitiveness of European companies and pushed up household bills.

In this new environment, many countries face an increasingly difficult trade-off among three key energy policy goals.

We need energy that is secure – because the geopolitical reality *has* changed.

We need energy that is sustainable – because the climate reality *has not* changed.

And we need energy that is affordable for households and businesses alike.

Different countries are approaching this trade-off in different ways.

Some are seeking to lower oil prices and strengthen energy security, even at the expense of the climate. Others are committing to renewables to deliver reliable, clean energy – but are finding the costs of the transition higher than expected.

Ultimately, only clean energy has the potential to deliver on all three goals, as Norway demonstrates.

The share of renewables in energy consumption here ranks among the highest in the world^[1], while household energy prices are around two-thirds of the EU average.^[2]

But for other countries to achieve the same, they must act more decisively.

The transition to a renewables-based system requires a massive investment push. The faster policymakers can create an environment in which such investment can flourish, the easier and less costly the transition will be.

As the Norwegian poet Olav H. Hauge once wrote, “*Dette er din veg [...] Og det er uråd å snu.*”, which translates as: “This is your road [...] And it is impossible to turn back.”^[3]

Today, I will explore how Europe’s road to renewables can deliver powerful benefits, if we unlock the right conditions.

Europe’s energy landscape

Before Russia’s invasion of Ukraine, Europe had in effect prioritised two goals of energy policy: sustainability and affordability.

As part of its *Fit for 55* targets, the EU aimed to raise the share of renewables in its energy consumption to as much as 45% by 2030.^[4] At the same time, almost half of its gas imports came from Russia.^[5]

This combination kept energy costs contained, facilitating Europe’s competitiveness.

Energy remained relatively cheap for energy-intensive industries, and periods of intermittency – when renewable output was low and gas served as backup – did not lead to significant price volatility.

But we ultimately paid the price for neglecting the third goal: energy security. When the geopolitical context changed, the consequences for our economy were severe – consequences that we, as central bankers, could not ignore.

First, we saw a surge in inflation.

Energy makes up less than one-tenth of the Harmonised Index of Consumer Prices consumption basket in the euro area. Yet when prices are both high and volatile, energy can have an outsized impact – not only on direct energy costs, but also on all other goods and services that depend on energy as an input.

Energy inflation in the euro area surged to 37% in 2022, pushing headline inflation to a record 8.4% that year.^[6] In response, the ECB had to implement the fastest monetary tightening in its history to bring inflation back under control.

Surging energy prices led to a second consequence: a lasting negative impact on our competitiveness.

Although the acute phase of the energy shock has passed, the new geopolitical reality has left an enduring imprint on Europe’s energy costs, weakening its position relative to other regions.

Electricity prices in the EU remain about two and a half times higher than in the United States, and gas prices almost four times higher.^[7] This gap is shaping how firms invest and innovate, and even where they choose to locate.

ECB research shows that European firms significantly reduce their capital and R&D expenditures in response to energy shocks – unlike their US counterparts.^[8]

There are growing concerns, too, that higher energy prices may even be contributing to deindustrialisation as European firms struggle against foreign competition.^[9]

The mistakes of Europe's past are also creating difficulties for its future.

Higher energy prices may make it harder for Europe to fully embrace the new technologies that will drive future productivity.

Access to cheap, plentiful energy will be crucial if Europe is to make the most of artificial intelligence. The International Energy Agency (IEA) projects that electricity demand from data centres will more than double by 2030.^[10]

We therefore need to bring energy costs down if we are to safeguard Europe's industrial competitiveness and sustain long-term growth.

Yet we cannot afford to do so by trading off other goals. We must ensure that our energy is secure and that we remain firmly committed to the climate.

The promise and challenges of renewables

The only viable path for Europe to achieve these objectives is to rely more on locally produced clean energy. This path could help meet goals on all three fronts.

First, renewables, alongside other clean technologies for producing electricity, are central to any credible plan to reduce the impact of climate change.

Second, renewables offer a level of energy independence that, given our lack of natural resources, Europe would never reach with imported fossil fuels.

Third, as the marginal cost of renewable electricity is close to zero, a system based largely on renewables should ultimately bring down energy prices.^[11]

But there is sometimes scepticism whether such price reductions are possible in Europe over the short to medium term.

The key issue is that building and operating a renewables-based system involves significant additional expenses, known as "system costs", which are passed on to energy bills.^[12]

These costs come from several sources. While some costs are unavoidable, others can be minimised if we are truly ambitious with the transition.

To start with, the transition to renewables requires massive investments in new generation capacity and modernised grids. The European Commission estimates that these will require an annual investment of nearly €150 billion.^[13]

But that number may rise further if restrictions on critical raw materials increase input costs or delay projects. The IEA finds that, if we exclude the top supplier, global supply could meet only about two-thirds of global demand for lithium, just over half for nickel and less than half for rare earths by 2035.^[14]

Then there are costs related to the inherent intermittency of renewables. This leads to higher price volatility, which ultimately feeds into higher average bills.

We saw this in November last year, when low wind output across much of Europe – especially in Germany – prompted a surge in gas-fired generation to meet demand.^[15] Electricity prices jumped in several countries, and the effects were also felt here in Norway.

There are also costs associated with curtailment – that is, when renewable output is deliberately reduced to keep the system balanced – often resulting in payments to providers.

The European Commission estimates that, by 2040, we could lose up to ten times more renewable energy generation than we lose today owing to grid constraints.^[16]

But there are three reasons why I see these challenges as surmountable.

First, while we cannot eliminate the costs associated with intermittency – after all, we cannot control the weather – we *can* substantially reduce them if we push through with the investment in generation capacity, grids and storage.

One recent study estimates that if European countries meet their solar and wind targets, electricity prices could fall by more than a quarter by 2030 – and become less volatile – owing to a weaker link between electricity and gas prices.^[17]

Curtailment costs would also fall: further research finds that each euro invested in upgrading the electricity grid translates into over €2 saved in system costs.^[18]

Second, infrastructure investment could be particularly effective in Europe owing to our geographic diversity. Southern Europe performs strongly in solar power, while northern and Atlantic coastal regions excel in wind energy.^[19]

Deeper energy market integration – for example through more cross-border interconnectors – would let countries share surplus electricity, smooth fluctuations from intermittent sources and use generation and grid capacity more efficiently.

Research underlines the benefits.^[20] Deeper cross-border integration is found to cut overall system costs by around 9% – equivalent to €26 billion annually – and reduce electricity prices more than isolated national approaches.^[21]

Third, the technology is moving firmly in our favour. Not only are renewable solutions becoming much cheaper, but the ability to store renewable energy through periods of intermittency is also improving fast.

The IEA finds that the cost of clean technologies has fallen by more than half over the past decade^[22], and that battery pack costs are now roughly a tenth of what they were 15 years ago.^[23]

With pooling and circular economy strategies, we can also reduce the resource intensity of these technologies. For example, one study estimates that the EU could potentially meet up to two-thirds of its metals demand for clean technologies in 2050 through local recycling.^[24]

These points make it clear that the solution to high “system costs” is not to weaken our clean energy targets and delay building new generation and grids. That would put Europe in the worst of both worlds.

In that scenario, our total investment costs would not go down. Instead, we would have a longer period where intermittency keeps our energy prices tied to gas, and where curtailment leads to wasteful payments and energy being squandered.

But if we manage to quickly unlock the investments needed to build a world-class renewables infrastructure, Europe can keep those other costs to a minimum.

Unlocking the potential of clean energy

So how can we unlock that investment? Policymakers must provide two things.

First, the right environment for financing.

If we factor in decarbonising industry, transport and energy supply, the financing needs for the green transition are massive – estimated at €1.2 trillion per year.^[25] The private sector will have to account for over two-thirds of this investment.^[26]

But even though Europe has ample private savings, current financing arrangements are not channelling supply towards demand. Nearly four in ten European firms see the lack of investor willingness to finance green investment as a very significant obstacle.^[27]

The missing link here is capital markets. Debt and equity financing currently rank lowest among the funding sources that firms expect to use for green investment.^[28] Deepening and integrating EU capital markets is critical to support the large-scale investments we need.

The good news is that the political momentum behind the capital markets union has never been greater – as underlined by the German Chancellor only a few days ago.

Second, policymakers need to create a predictable environment for investment.

Investors will not step forward if the green transition is clouded by uncertainty – especially if they also see growing pushback against green initiatives in other parts of the world.

Creating the right environment begins with credibility: following through on existing green targets and maintaining a stable carbon price. Wavering on those commitments would risk chilling investment just when it is most needed.

Credibility must also be matched by speed. Across Europe, investors face slow and fragmented permitting procedures that delay progress.

In some Member States, completing the permitting process can take up to five years for utility-scale solar photovoltaic projects and up to nine years for onshore wind.^[29] These timelines must be shortened if the EU is to meet its green goals.

Finally, policymakers must build confidence in future electricity demand.

For instance, in Europe, electricity still faces higher taxes than gas, discouraging electrification. While this gap will narrow as carbon pricing is extended to heating fuels, governments can already act by lowering electricity taxes.

Collectively, Europe has the resources to succeed. What it now needs are deeper capital markets and steadfast policies to turn its green ambitions into reality. The goal, ultimately, is to make progress

towards a true energy union.

Conclusion

Let me conclude.

Europe's recent energy crisis has revealed a hard truth: our dependence on imported fossil fuels is no longer sustainable. An accelerating climate crisis makes this lesson even clearer.

Renewables offer the clearest path to minimise the trade-offs between the energy policy goals of security, sustainability and affordability.

We know the road that Europe must take – and it is a path that citizens support. Nearly nine in ten Europeans want the EU to expand renewable energy.^[30]

Some of the costs associated with the transition, such as the required investment, will be unavoidable. But if we create the ideal conditions in which that investment can flourish, we can ensure that the transition remains cost-effective.

The anthropologist Jane Goodall, who sadly passed away this month, reminded us: "What you do makes a difference. And you have to decide what difference you want to make."

Europe must now decide. Either we remain with an unsustainable and expensive status quo, or we create an environment that can unlock the investment needed for sustainable, secure and affordable energy.

I am confident Europe will choose wisely.

Thank you.

1.

International Energy Agency, Global ranking for 2021, "[Norway](#)".

2.

Data for the second half of 2024 – the most recent period that allows for direct comparison with the EU. Data excludes taxes and levies. See Eurostat (2025), "[Electricity price statistics](#)", April.

3.

From the poem "Din veg".

4.

The EU has set a binding target to increase the share of renewables in its energy consumption to at least 42.5% by 2030, with the more ambitious aim of reaching 45% by that time.

5.

Russia provided around 45% of the EU's total gas imports in 2021. See European Commission (2022), "[Questions and Answers on REPowerEU: Joint European action for more affordable, secure and sustainable energy](#)", 8 March.

6.

Lane, P.R. (2025), “[The conduct of monetary policy](#)”, keynote speech at the ECB Conference on Monetary Policy 2025: bridging science and practice, 6 October.

7.

For a more detailed discussion, see Bijnens, G. et al. (2025), “[How enduring high energy prices could affect jobs](#)”, *The ECB Blog*, 5 May. Electricity and gas prices have been updated to reflect the latest data and differ slightly from those detailed in the blog post.

8.

Specifically, oil shocks. See Anaya Longaric, P. et al. (2025), “[Oil Shocks and Firm Investment on the Two Sides of the Atlantic](#)”, *Working Paper Series*, No 3116, ECB, Frankfurt am Main, 22 September.

9.

See, for instance, McKinsey (2024), “[Electricity demand in Europe: Growing or going?](#)”, 24 October.

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International Energy Agency (2025), “[Energy and AI](#)”, 10 April.

11.

Cevik, S. and Ninomiya, K. (2022), “[Chasing the Sun and Catching the Wind: Energy Transition and Electricity Prices in Europe](#)”, *IMF Working Paper Series*, Issue 220, 4 November.

12.

Helm, D. (2025), “[The price of energy and the system costs of renewables](#)”, 26 August.

13.

See Table 9 in European Commission (2023), “[Investment needs assessment and funding availabilities to strengthen EU's Net-Zero technology manufacturing capacity](#)”, 23 March.

14.

IEA (2025), “[Global Critical Minerals Outlook 2025](#)”, 21 May.

15.

During Germany’s “Dunkelflaute” – a period of low sun and wind – in early November 2024, renewables supplied only 30% of public electricity generation, while fossil fuels provided 70%. See Clean Energy Wire (2024), “[Prolonged ‘Dunkelflaute’ shrinks Germany’s renewables output in early November](#)”, 11 November.

16.

Thomassen, G. et al. (2024), [Future-proofing the European power market – redispatch and congestion management](#), Publications Office of the European Union, JRC137685; Draghi, M. (2024), [The future of European competitiveness: Part B](#), September.

17.

Navia Simon, D. and Diaz Anadon, L. (2025), “[Power price stability and the insurance value of renewable technologies](#)”, *Nature Energy*, Vol. 10, pp. 329-341.

18.

European Network of Transmission System Operators for Electricity (2025), [Opportunities for a more efficient European power system by 2050](#), 9 April.

19.

See Figure 7 in International Monetary Fund (2025), “[IMF Staff Background Note on EU Energy Market Integration](#)”, 16 January. See also Kammer, A. (2025), “[Integrating the EU Energy Market to Foster Growth and Resilience](#)”, remarks for EFC, 13 January.

20.

See Zachmann, G. et al. (2024), “[Unity in power, power in unity: why the EU needs more integrated electricity markets](#)”, *Bruegel Policy Brief*, No 2024/03, 14 February; and Potrč, S. et al. (2021), “Sustainable renewable energy supply networks optimization – The gradual transition to a renewable energy system within the European Union by 2050”, *Renewable and Sustainable Energy Reviews*, Vol. 146, August.

21.

Child, M. et al. (2019), “Flexible electricity generation, grid exchange and storage for the transition to a 100% renewable energy system in Europe”, *Renewable Energy*, Vol. 139, August, pp. 80-101.

22.

International Energy Agency (2025), “[World Energy Investment 2025](#)”.

23.

International Energy Agency (2024), “[Rapid expansion of batteries will be crucial to meet climate and energy security goals set at COP28](#)”, 25 April.

24.

Van Acker, K. et al. (2022), “[Metals for Clean Energy: Pathways to solving Europe’s raw materials challenge](#)”, 5 October.

25.

See Table 9 in European Commission (2023), “[Investment needs assessment and funding availabilities to strengthen EU's Net-Zero technology manufacturing capacity](#)”, *Commission Staff Working Document*, 23 March.

26.

See Chart 1 in Bouabdallah, O. et al. (2025), “[Time to be strategic: how public money could power Europe’s green, digital and defence transitions](#)”, *The ECB Blog*, ECB, 25 July.

27.

Nerlich, C. et al. (2025), “[Investing in Europe’s green future: Green investment needs, outlook and obstacles to funding the gap](#)”, *Occasional Paper Series*, No 367, ECB.

28.

The types of funding encompass bank loans, loans with fiscal support, retained earnings, debt securities and equity. See Chart 4 in Andersson, M. et al. (2025), “[Green investment needs in the EU and their funding](#)”, *Economic Bulletin*, Issue 1, ECB.

29.

International Energy Agency (2025), “[IEA Support to Accelerating Renewable Energy Permitting \(ARPE\)](#)”, 18 April.

30.

European Commission (2025), “[Europeans consider tackling climate change a priority and support energy independence](#)”, *press release*, 30 June.

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