

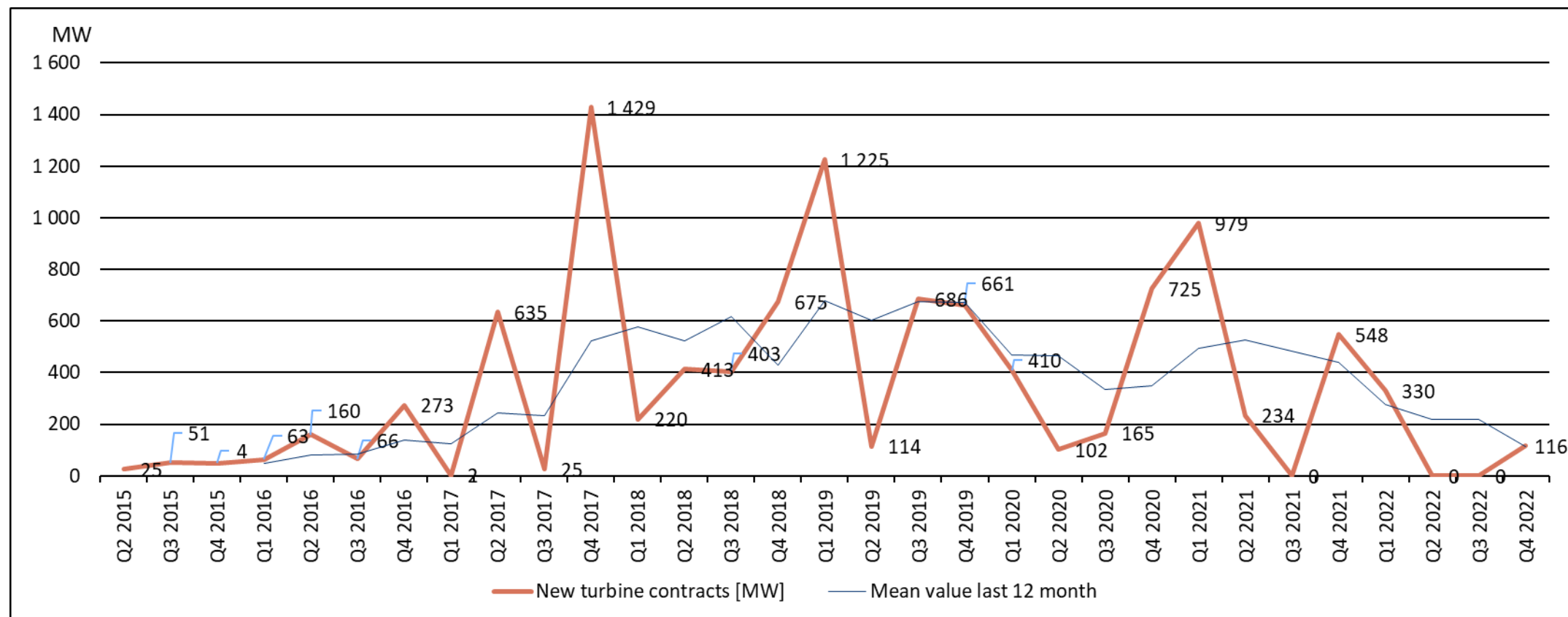
Statistics and Forecast – Q4 2022

02/03/2023

Statistics and forecast updated quarterly.

The figures are produced with data from turbine manufacturers and other market participants.

Turbine Contracts per Quarter (Megawatt, MW)

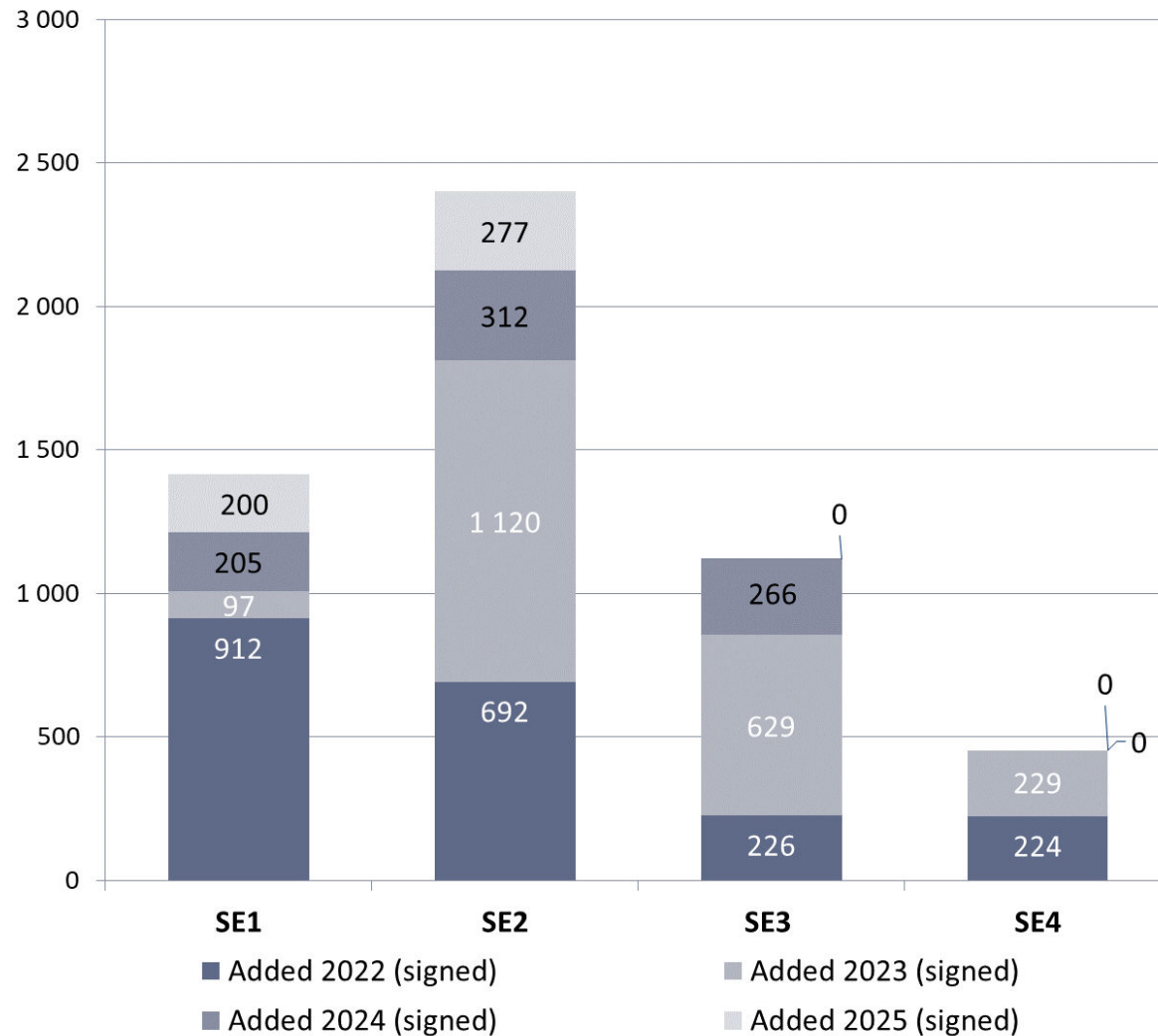


Scheduled Commissioning (Megawatt, MW)

According to turbine manufacturers order books for installations.

2022	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2023 (Tot)	2024	2025
2054	169	677	627	602	2075	783	477

Scheduled Commissioning* (Megawatt, MW)

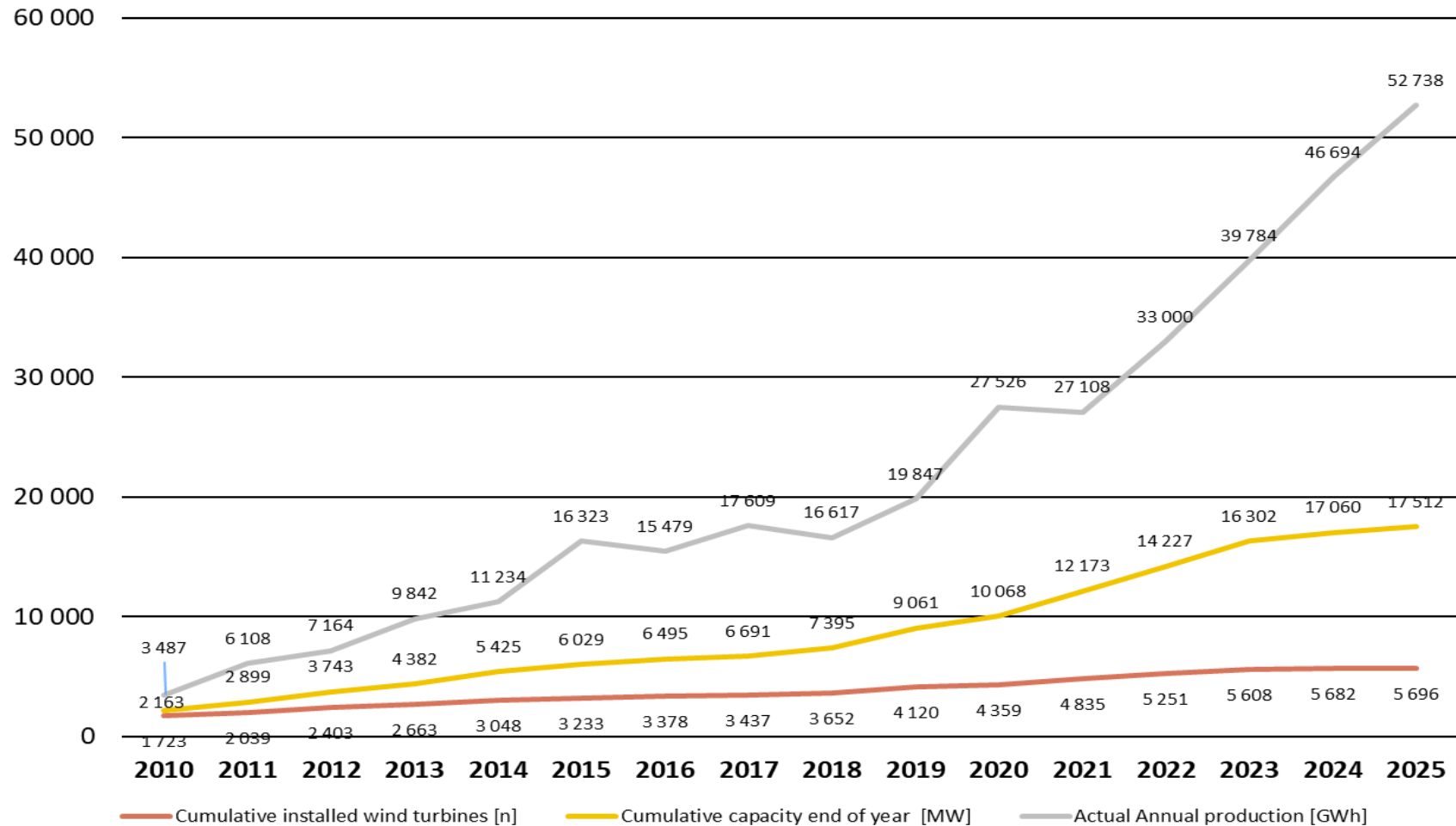


* Confirmed orders

Short Term Forecast (12/02/2023)

- Continued high expansion in 2023.
- Expansion will slow down after 2024 – especially in southern Sweden.
- By the end of 2025, SWEA estimates that wind power will reach an installed capacity of 17,500 megawatts (MW) and an annual production of 52.7 terawatt-hours (TWh). The change from the previous forecast is due to more cautious assessments of additional projects, based on new data from turbine manufacturers and more uncertain global situation.
- The short-term forecast is based on investment decisions and an estimate of buildable projects and new projects based on the permitting situation.

Short Term Forecast (12/02/2023)



Different Stages in the Permitting Process

- **Under construction:** Project with investment decisions taken and turbines ordered.
- **Announced:** Projects with permits and backing investors, but investment decisions have not yet been made.
 - Can be operational 2-3 years after investment decision.
- **With permits:** Projects with environmental permits, but the grid concession (electricity grid permit) remaining.
 - Can be operational 3-5 years after the grid connection is decided.
- **Projects under permit review:** Projects that have applied for an environmental permit to the County Administrative Board's Environmental Assessment Delegation or to the Government.
 - Attaining an environmental permit can take 3-7 years.
 - For onshore wind power, 45% have received environmental permits (2014-2021).
 - For offshore wind power, the figures apply to both projects in the Swedish economic zone and the territorial sea (in total).
- **Consultation:** Projects in pre-study, for which an application for an environmental permit has not yet been submitted.
- **Early-stage projects:** Projects that have not yet started the formal consultation process.

Project Portfolio (31/12/2022)*

Under construction	Onshore	Offshore	Total
WTG's	765	0	789
Capacity (MW)	4 279	0	4 279
Annual normal production (TWh)	14.2	0.0	14.2

Announced	Onshore	Offshore	Total
WTG's	186	0	186
Capacity (MW)	1 156	0	1 156
Annual normal production (TWh)	3.8	0.0	3.8

With permits	Onshore	Offshore	Total
WTG's	842	46	888
Capacity (MW)	5 093	639	5 732
Annual normal production (TWh)	16.1	2.8	18.9

* The data in the Swedish Wind Energy Association's project portfolio is based on reported data from SWEA members, Vindbrukskollen.se and statistics compiled by Westander Klimat och Energi on behalf of SWEA.

Project Portfolio (31/12/2022)*

Projects under permit review	Onshore	Offshore	Total
WTG's	1 180	1 293	2 473
Capacity (MW)	7 700	18 975	26 624
Annual normal production (TWh)	25.6	87.0	112.7

Consultation	Onshore	Offshore	Total
WTG's	115	3 160	3 275
Capacity (MW)	749	57 710	58 460
Annual normal production (TWh)	2.5	250.9	253.4

Early-stage project	Onshore	Offshore	Total
WTG's	448	2 131	2 579
Capacity (MW)	3 120	39 840	42 960
Annual normal production (TWh)	10.5	174.5	185.0

* The data in the Swedish Wind Energy Association's project portfolio is based on reported data from SWEA members, Vindbrukskollen.se and statistics compiled by Westander Klimat och Energi on behalf of SWEA.

366 Terawatt-hours (TWh) in Permitting Process

	WTG's	MW	TWh
Under construction	765	4279	14,167
Announced	186	1156	3,762
With permits	888	5732	18,867
Projects under permit review	2473	26 624	112,684
Consultation	3275	58 460	253,426
Early-stage projects	2579	42 960	184,953
	10 166	139 211	587,858

253+112 =
366 TWh
in permitting
process

280 Terawatt-hours (TWh) Already by 2035

- The Swedish Energy Agency, The Swedish TSO (Svenska Kraftnät), the Swedish Energy Market Inspectorate and the Swedish Transport Administration presented their first joint report on the societal electrification.* The report analyses, among other things, Sweden's future electricity needs.
- In the highest scenario, annual demand increases to 280 terawatt hours (TWh) already in 2035, reaching 370 TWh in 2045 as a result of large-scale electrification of industry.
- In the lower scenario, demand increases to 210 TWh by 2045 due to assumptions of less extensive electrification.
- The desire to meet the climate threat and new climate legislation are driving investments in electrification to move away from fossil fuels.
- Continued Swedish competitiveness therefore depends on the necessary investments in electricity production and electricity grids being in place.

[*Swedish Energy Agency Press Release \(in Swedish\)](#)

Possible to Meet Expanded Electricity Demand by 2035

- To reach 280 terawatt-hours (TWh) by 2035, 110 TWh of new electricity generation needs to be built in Sweden.
- This corresponds to an annual expansion of approx. 9 TWh.
- Today, 366 TWh of wind power is in permitting process.
 - 112 TWh projects under permit review
 - 253 TWh in consultation
- In order to achieve a sufficiently large expansion, permits must be granted at the same level as in the period 2014-2021. The current level is not sufficient.

Example: What Same Share of Permits as 2014-2021 Could Mean for Wind Power Development by 2035

Wind power could increase by over 100 terawatt-hours (TWh) by 2025-2035

- According to our forecast (as of 2023-02-12), wind power production will be 52.7 TWh in 2025
 - There are about 18 TWh of permitted onshore wind power. If two thirds receive investment decisions within two years, around 12 TWh of onshore wind could be added in 2026-2027
 - $52,7 + 12 = 64,7$ TWh wind power by 2027
- If 50% of the onshore wind power in the permitting process receive permits, investment decisions are made and are built at a steady pace, 12.5 TWh of onshore wind power could be added by 2026-2029.
 - $52,7 + 12 + 12,5 = 77,2$ TWh wind power by 2029
- If Krieger's Flak is realized and put into operation in 2029, 2.8 TWh could be added in 2029
 - $52,7 + 12 + 12,5 + 2,8 = 80$ TWh wind power by 2029
- If 50% of the offshore wind power in the permitting process receive permits, investment decisions are made and are built at a steady pace, 43 TWh of offshore wind could be added 2029-2035.
 - $52,7 + 12 + 12,5 + 2,8 + 43 = 123$ TWh wind power by 2035

Uncertainties Ahead

- In Europe, according to WindEurope*, wind power investment fell by 47% in 2022, mainly due to rising inflation and political intervention in the energy market.
- In the second and third quarters of 2022, Sweden had no new orders for wind turbines. But now there has been a slight uptick - 20 turbines totaling 116 megawatts (MW).
- Continued uncertainty in the energy market ahead but great potential in Sweden. However, the Swedish investment climate needs to improve.

[*WindEurope](#)

Willingness to Invest in Wind Power High, But Cannot Be Taken For Granted

External Factors:

- Russia's war of aggression in Ukraine increased electricity prices sharply in Europe.
- High energy prices quickly increased inflation, making it more expensive to invest.
- The United States has passed the Inflation Reduction Act to increase the willingness to invest in the country. Many are now considering whether industrial climate investments should be made in the EU or the US.
- Crisis measures in the energy market and the EU's review of a new electricity market reform create policy uncertainties ahead.
- Electrification requires access to more raw materials, which Sweden has great potential to contribute, thanks to e.g., deposits of rare earth metals and fossil-free steel.

Domestic Factors:

- Sweden risks falling behind other countries in simplifying the permitting processes for electricity production. The government has not yet presented any sharp reforms to facilitate wind power.
- Continued an overall polarised debate in Sweden on power types. The municipal veto continues to stop many wind power projects.
- Wind power industry wants to and could contribute to military and civil defense, if given the opportunity.
- Slow grid deployment and lengthy permitting processes are an obstacle to both investment decisions and getting connections for new parks.

Ensuring Attractive Swedish Investment Climate

- Sweden's competitiveness depends on our ability to meet the increased electricity demand of the industrial and transport sectors. Electricity production must be emission-free and at the lowest possible cost.
- Around 9 terawatt-hours (TWh) annual expansion is needed to meet the demands of industry and transport by 2035.
- Policies must therefore be put in place to secure and accelerate expansion by 2035. Wind power is the fastest and cheapest form of power to be deployed on a large scale.
- Shorten permitting processes for both new electricity generation and grids, introduce technology-neutral incentives and reforms, and secure a good long-term investment climate.

Thank you!

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Electrical grid and market

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