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ENERGY RESEARCH

Empowering change? – Decoding the Mantelerlass and its impact on Switzerland's energy landscape

Public Report

14 May 2024

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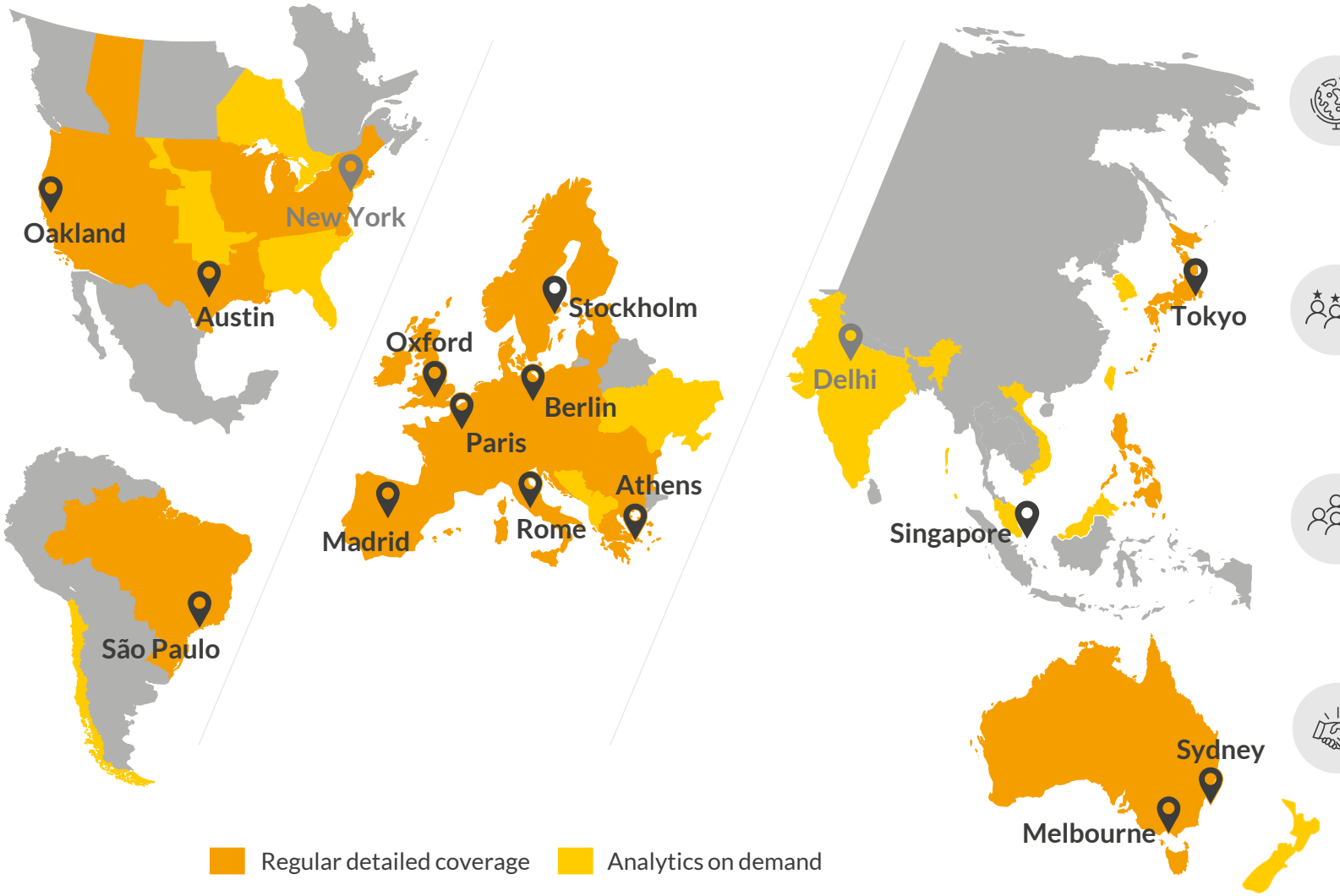

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Source: Aurora Energy Research

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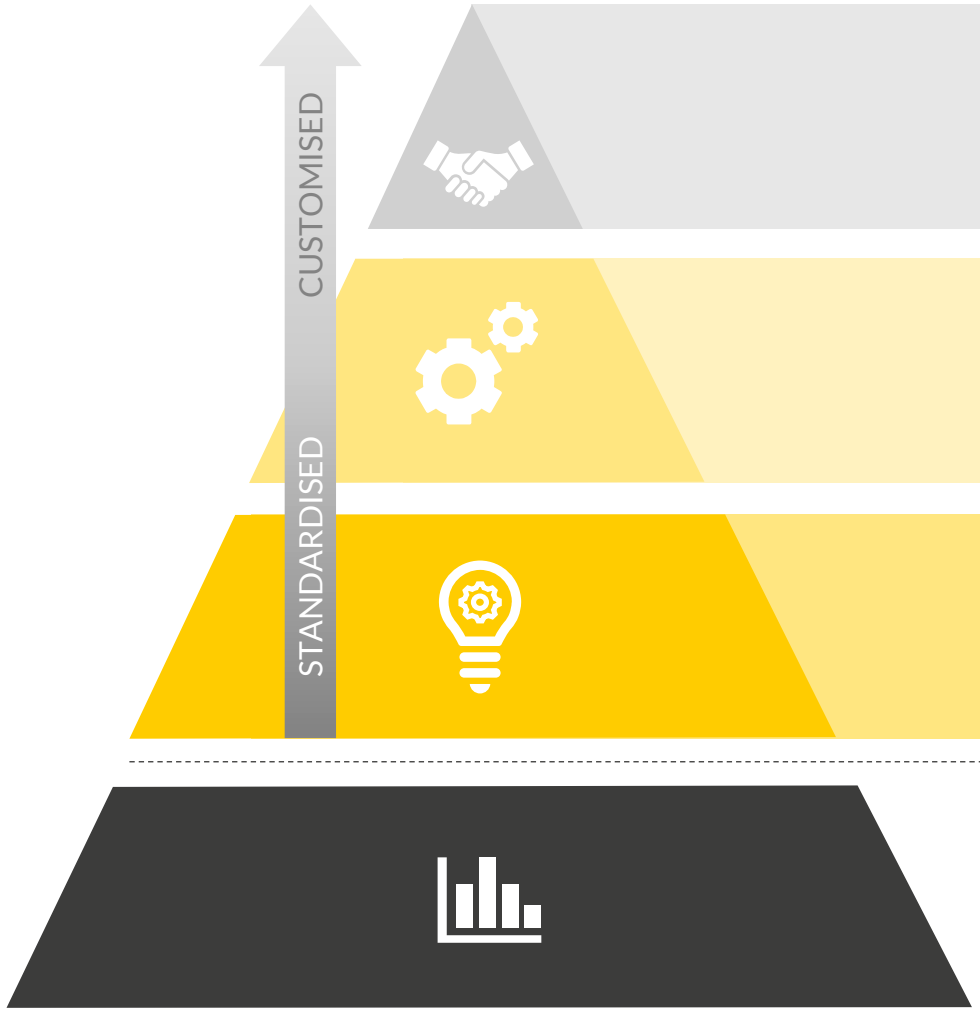

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Source: Aurora Energy Research

We work with a very broad range of clients … their constant challenge keeps us up on our toes and ensures our independence

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> *"With its capabilities, intellect and with its credibility Aurora plays an essential role bringing the dialogue [in the global energy transition] to a different plane"*
>
> **Ben van Beurden, CEO, Shell**

> *"Aurora analysis and the provision of reliance was crucial for our debt funding. Their ability to explain market logics and revenue streams was vital for this successful financing."*
>
> **Jeremy Taylor, Director, Green Frog Power**

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Source: Aurora Energy Research

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Looking to understand more about the changing dynamics of the Swiss energy market?
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Get in touch with our Commercial Associate

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The Swiss power system relies heavily on hydro and nuclear power and depends on imports in the winter half-year to cover demand

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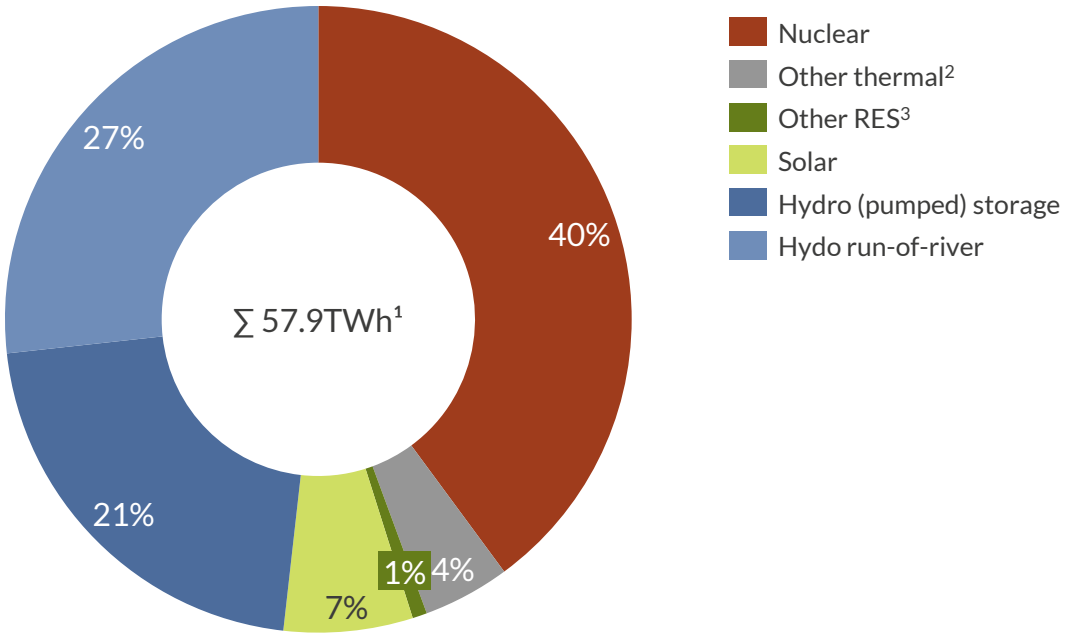
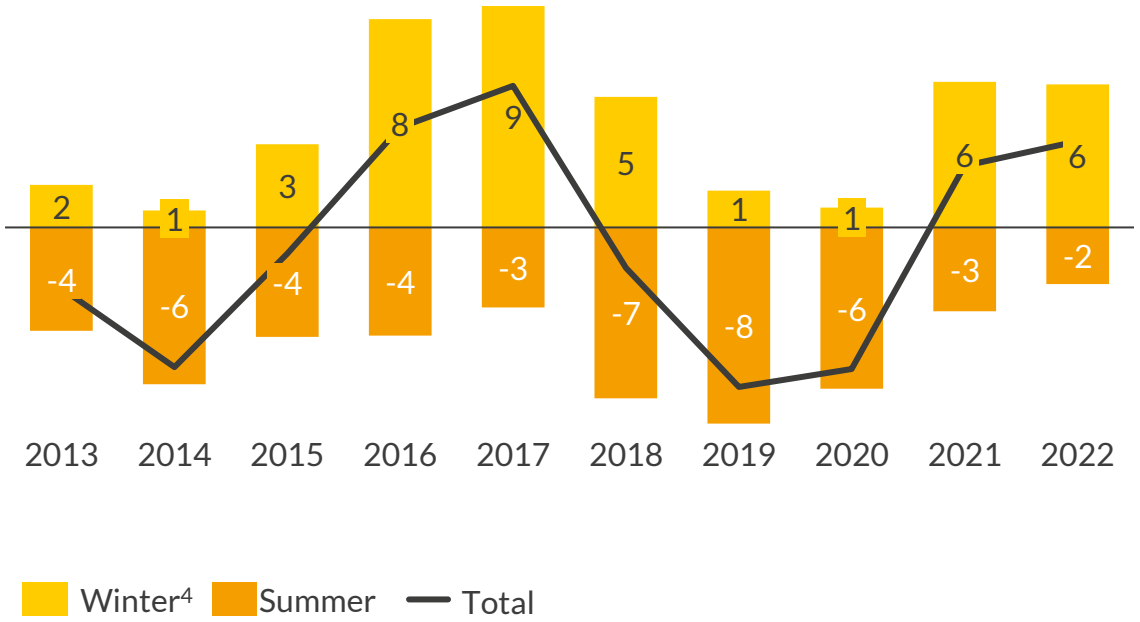
Swiss power generation mix in 2022

%



Historical net imports

TWh



- Switzerland's power system is largely decarbonised already:
  - With a 48% share, hydro is the most important generation technology.
  - Nuclear constituted the second most important power source contributing 40% of 2022 generation to the power mix.
  - While the share of solar generation has increased over the last years, it still plays a minor role with a 7% share of total generation in 2022.

- Switzerland is highly interconnected with neighbouring countries and is a major hub for physical power flows.
- Due to high renewables capacity, Swiss power imports show strong seasonal fluctuation. Over the last 10 years, the country has generally been a net importer of power in the winter months and a net exporter in the summer months.

1) Net generation excluding storage pump consumption. 2) Includes waste, gas and on-site industrial thermal plants. 3) Includes onshore wind and biogas generation. 4) Winter half-years are considered from 1 October to 31 March.

Sources: Aurora Enery Research, BFE

Rising demand due to decarbonisation efforts and decreasing supply due to nuclear exit will exert increasing pressure on the Swiss power system

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Key challenges for the Swiss power sector

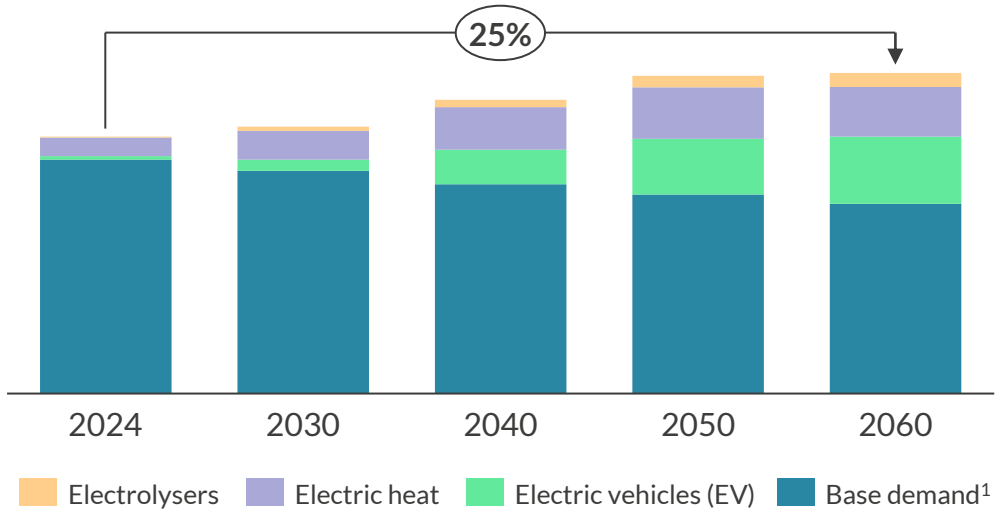
Reaching climate targets through sector coupling

Impact: power demand increase

- We expect total demand to increase by 25% between 2024 and 2060 with most demand growth coming from the electrification of transport and from heat pumps.
- Base demand is expected to decrease, as improvements in efficiency overcompensate the impact of continuing economic growth.

Net annual power demand by type

TWh



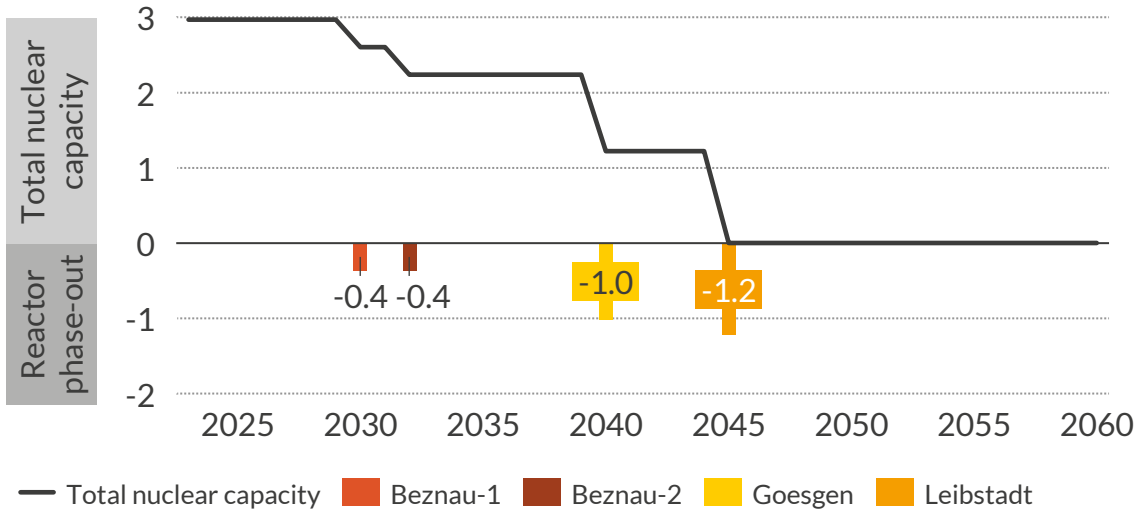
Nuclear phase-out

Impact: power supply decrease

- In 2011, Switzerland decided to gradually exit nuclear power. Assuming a 60-year lifetime of existing nuclear plants, we expect nuclear energy to be fully phased out by 2045.
- Prolonged nuclear lifetime could partially alleviate supply tightness in winter months, yet might require expensive investments in plant modernisation and safety upgrades.

Nuclear capacity shutdown timeline (total end of year)

GW



1) Underlying base demand excluding heat pumps, electric vehicles, and electrolysis.

Source: Aurora Energy Research

The Mantelerlass, targeting renewables expansion and security of supply, is set to take effect in 2025 pending a successful popular vote on 9 June

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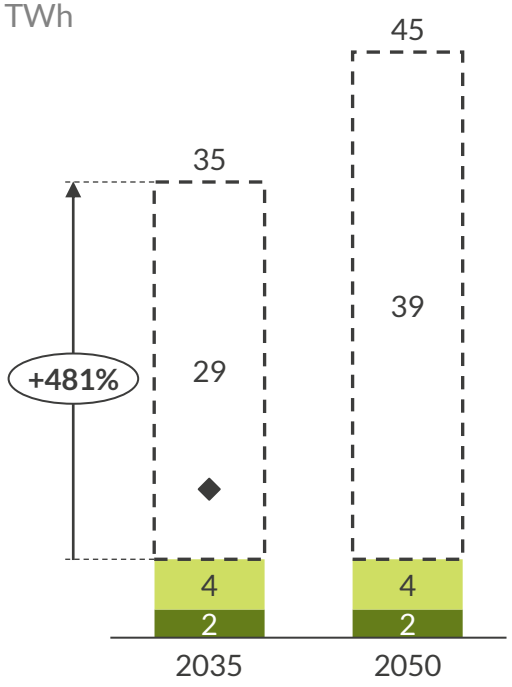
Main focus areas of the Mantelerlass (Federal Act on a Secure Electricity Supply with Renewable Energy)

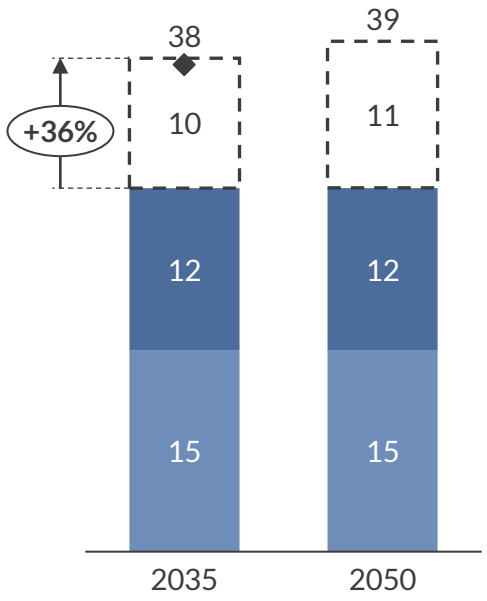
Renewables expansion — Deep dive

Objective: accelerating buildout of renewables (RES)

Non-hydro RES generation target
TWh



Hydro net generation target
TWh



2022 solar output
2022 other non-hydro RES output
2022 hydro storage output[1]
2022 run-of-river output
EnG[2] target
Mantelerlass target

Security of supply — Deep dive

Objective: decreasing import dependency, especially in winter[3]

	Targets	Target year
Winter[3] generation increase	▪ Additional 6TWh, thereof 2TWh dispatchable	2040
Winter[3] net import limit	▪ 5TWh	N.A.
Annual demand reduction through efficiency gains	▪ 2TWh	2035
Yearly per capita electricity consumption	▪ -13% compared to 2000 ▪ -5% compared to 2000	2035 2050
Yearly per capita primary energy consumption	▪ -43% compared to 2000 ▪ -53% compared to 2000	2035 2050

The Swiss electorate will vote on the **Mantelerlass** on 9 June 2024. The referendum was taken up after the bill was passed by the National Council and the Council of States in 2023.

1) Net of pumped hydro consumption. 2) Energy Act (*Energiegesetz*). 3) Winter half-years are considered from 1 October to 31 March.

Sources: Aurora Energy Research, Federal Act on a Secure Electricity Supply with Renewable Energy, Energy Act

Renewables buildout shall be incentivised through new subsidy schemes, simplified permitting procedures and buildout mandates

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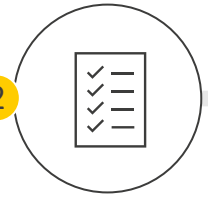
Key measures to accelerate renewables buildout

1 Additional subsidy schemes

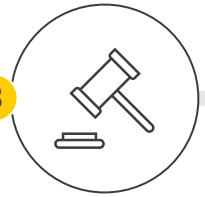
- Sliding market premium (CfD[1]) available for hydro[2], solar PV[3], wind, and biomass plants.
- New investment grant funding rates for solar PV to incentivise the buildout of larger assets and increase winter generation.
- Project planning investment grant for hydro, onshore wind and geothermal assets.

2 Facilitation of permitting procedures



- Large renewables assets are now considered of national interest, necessitating their inclusion in the balance alongside other national interests and superseding regional ones[4].
- Facilitation of permitting procedures for different solar PV categories.

3 Mandatory RES requirements



- Minimum 20% domestic renewables supply requirement for base supply (*Grundversorgung*).
- Mandatory rooftop solar installations on new buildings with a >300 square meter rooftop or facade surface.

4 Harmonised RES feed-in tariffs

- Harmonised renewables feed-in tariff[5], including:
  - Minimum tariff for assets <150kW determined by the Federal Council.
  - Quarterly average market reference price for assets ≥150kW.

1) Contracts for Difference. 2) For assets >1MW if newbuilt, or >300kW if expanded or renovated. 3) For assets ≥150kW without self-consumption. 4) Suitable areas for solar installations of national interest must be included in the structural plans of the cantons. 5) Only applicable in case of tariff disagreement between network operator and renewables supplier.

Sources: Aurora Energy Research, Federal Act on a Secure Electricity Supply with Renewable Energy, Energy Act, BFE Faktenblatt zur Vernehmlassung der Verordnungsänderungen

The establishment of a winter reserve, promotion of storage assets and improved integration of prosumers shall ensure security of supply

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Key measures to maintain security of supply

Winter reserve

1

- Winter reserve with mandatory participation for large hydro storage[1] assets.
- Temporary increase in electricity production through a reduction in residual water volumes for hydro storage in case of supply shortage.

Promotion of storage assets

2

- Exemption from grid usage fees for storage assets and power-to-X plants[2].

Strengthening of prosumers

3

- Allowance to form local electricity communities (LEGs).
- Possibility to implement dynamic grid usage fees.
- Grid operators are allowed to undertake curtailment without the consent of renewables operators[3].

Energy efficiency obligation

4

- Annual efficiency improvement targets for power suppliers[4].
- Country-wide programs for standard electricity efficiency measures.

1) Assets with storage ≥10GWh. 2) Exemption depends on end consumption and power fed into the grid. 3) Relevant for prosumers as most renewables (solar) capacity in Switzerland is in the residential space. 4) Determined by the Federal Council.

Sources: Aurora Energy Research, Federal Act on a Secure Electricity Supply with Renewable Energy, Energy Act, BFE Faktenblatt zur Vernehmlassung der Verordnungsänderungen

If the Mantelerlass is not adopted, uptake of renewables and flexibility options will be slowed down, increasing import dependence

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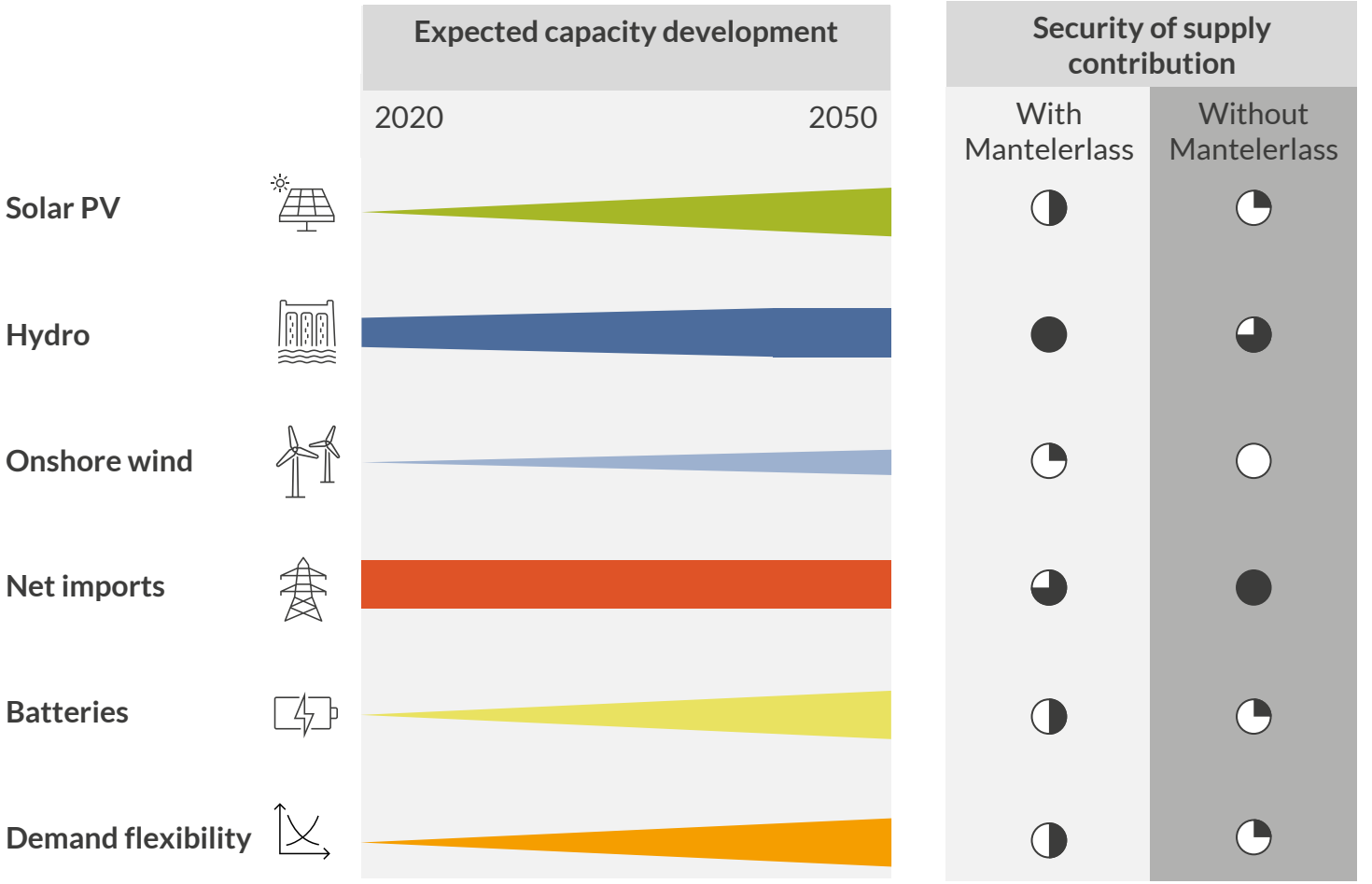
Technology options for providing security of supply in the long term



Comment on security of supply (assuming Mantelerlass is adopted)

- Additional subsidy schemes and facilitated permitting for large projects, yet buildout expected to increase generation fluctuations and availability in winter is limited.
- Facilitates buildout of distinct projects, slightly improving hydro's role as main power and flexibility provider.
- Excessive permitting procedures still expected to limit large buildout despite additional subsidy schemes and slightly eased permitting requirements.
- Net imports in winter expected to slightly decrease due to new targets and efficiency gains, yet still strong winter import dependence expected.
- Exemption from grid usage fees expected to accelerate buildout and increase short-term system flexibility.
- Dynamic grid usage fees and LEGs[1] expected to increase flexibility of demand, facilitating integration of intermittent renewables.

1) Local electricity communities.

Sources: Aurora Energy Research, BFE

Swiss Power & Renewable Forecasts:

Dive into key market analysis and forecasts for the Swiss power and renewables markets

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