Scenarios for 100% Renewable Electricity in Austria

Renewable Electricity in Austria – Status Quo

R. Gaugl

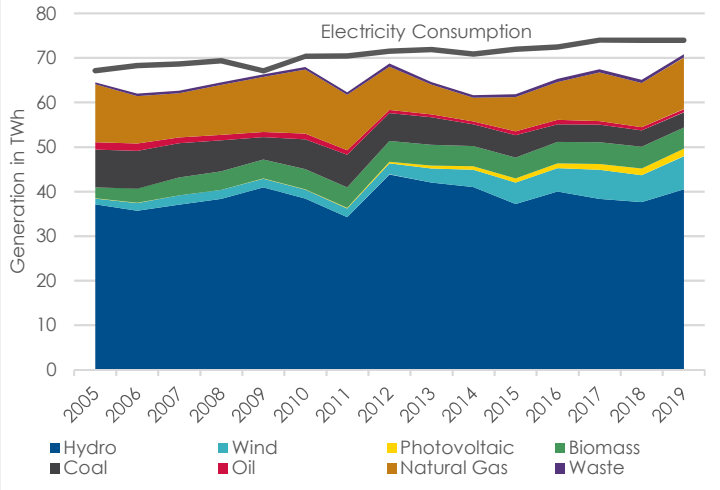

Figure 1. Development of electricity production and electricity consumption in Austria, 2005-2019 [1]

Until 2030 the Austrian federal government aims at increasing the share of renewable electricity to 100%. As of 2019, RES-E held a share of 75.1%[1] in total electricity generation in Austria. To bridge the gap an expansion of 27 TWh of renewable electricity production is aspired (11 TWh photovoltaics, 10 TWh wind, 5 TWh hydro and 1 TWh biomass).

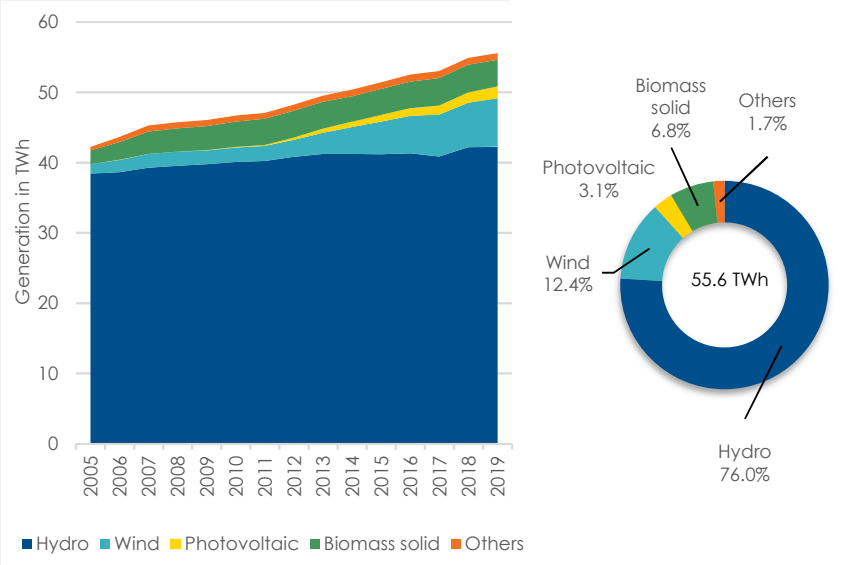

Figure 2. Development of renewable electricity production in Austria, 2005-2019 and distribution of renewable electricity generation in 2019 [1]

In 2019, hydro power plants accounted for 76.0%[1] of the total renewable electricity generation of 55.6 TWh. Wind and solar have gained in importance in recent years contributing 12.4%[1] and 3.1% respectively to the renewable electricity production. Electricity generation from solid biomass and other renewables has been fairly constant over the years reaching 6.8% and 1.7% respectively in 2019.

[1] The EU Renewable Energy Directive uses normalized values (to compensate fluctuations) for hydro and wind production, therefore the values differ from the values in the introduction and the next chapters which use real values.

Hydro

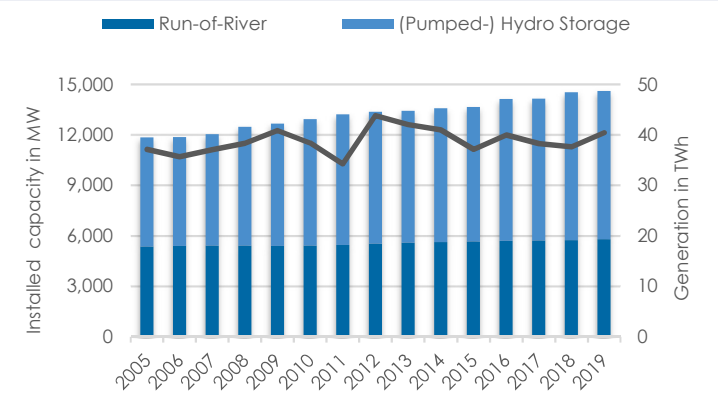

Figure 3. Installed capacity of (pumped-) hydro storage and run-of-river power plants [2] and electricity generation from hydro power plants in Austria [1], 2005-2019

In 2019, 2,923 run-of-river power plants with an installed capacity of 5,722 MW and 113 (pumped-)storage power plants with an installed capacity of 8,795 MW were in place in Austria [2]. As production from hydro power plants is dependent on precipitation, considerable fluctuations of the electricity output through the years can occur.

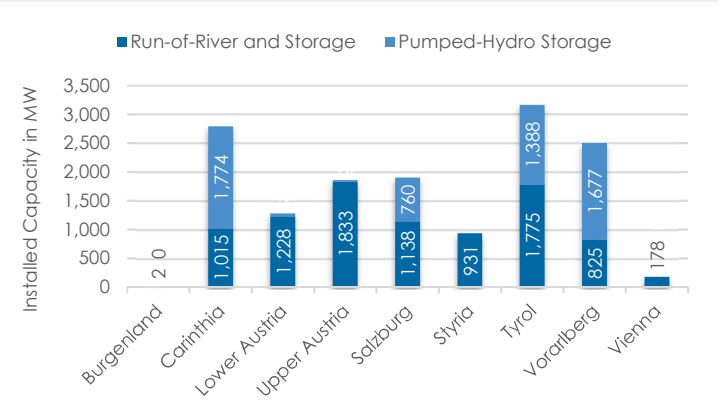

Figure 4. Installed capacity of run-of-river and storage power plants and pumped-hydro storage per state in Austria in 2019 [3]

Tyrol, Carinthia and Vorarlberg are the federal states with the highest installed hydro power capacity. Lower Austria and Upper Austria have a high share of run-of-river power plants.

Wind

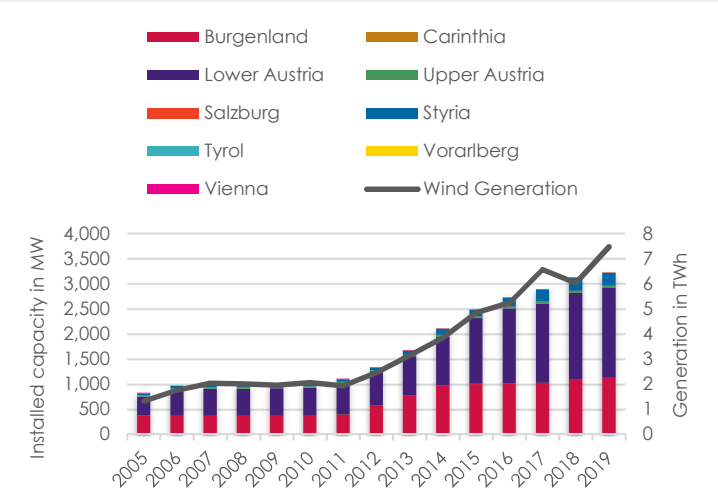

Figure 5. Installed capacity of wind power plants per state [3] and electricity generation from wind power plants in Austria [1], 2005-2019

Wind power has seen the highest increase of installed capacity of all renewable energies over the last 15 years. The installed capacity nearly quadrupled to 3,225 MW in 2019. As of 2019 Lower Austria had the largest wind power capacity installed with 1,774 MW followed by Burgenland with 1,140 MW. [3]

Electricity generation from wind power has reached a new high in 2019 with 7.5 TWh [1].

Photovoltaic

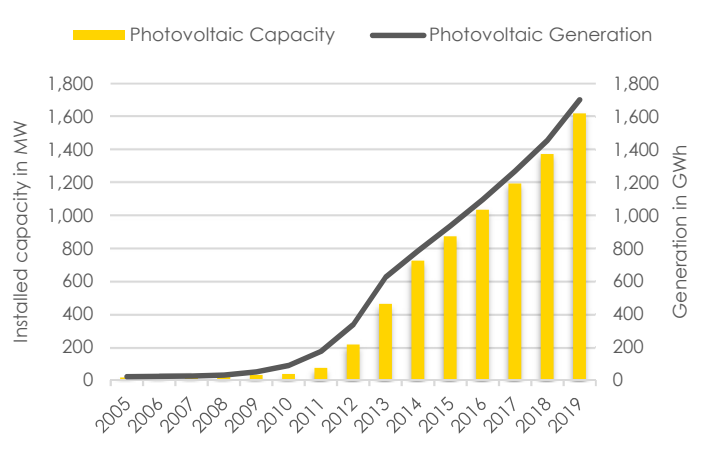

Figure 6. Installed capacity of photovoltaic [2] and electricity generation from photovoltaic in Austria [1], 2005-2019

The rise of photovoltaic started around 2012, since then the average newly installed solar power capacity was roughly 193 MW per annum, which led to 1 619 MW of installed solar power in 2019 [2].

Electricity generation from photovoltaics also grew, and in 2019 1,702 GWh were produced by solar power [1]. 822 GWh were fed into the public grid [2].

Biomass

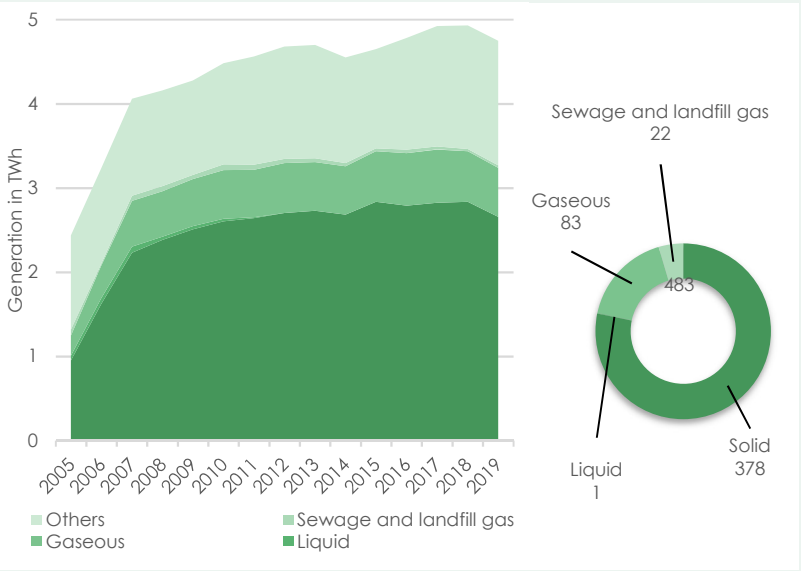

Figure 7. Development of electricity generation from biomass (solid, liquid, gaseous, sewage and landfill gas, others) in Austria [1], 2005-2019 and installed capacity 2019[2] [4]

Electricity production from biomass has stayed nearly constant since 2006. With the generation of 4.75 TWh biomass contributed only 6.7% to the total electricity production in 2019.

In 2019 solid biomass accounted for more than 78% of the total installed capacity of 483 MW. Gaseous biomass came second with a share of around 17% and sewage and landfill gas made up roughly 5% of installed capacity (see right side of Figure 7). [4]

References

[1] Statistik Austria, Gesamtenergiebilanz Österreich 1970 bis 2019 (Detailinformation)
[2] E-Control, Bestandsstatistik Jahresreihen von Juli 2020
[3] Statistik Austria, Gesamtenergiebilanz [Bundesländer] 1970 bis 2019 (Detailinformation)
[4] E-Control, Bestandsstatistik Engpassleistung nach Kraftwerkstypen von Juli 2020

[2] No installed capacity for Others.