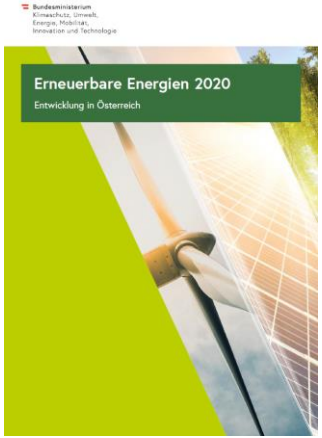
Renewables in Austria

Version based on Oktober 2022 REWP, with some updates

Austrian Energy Agency (AEA)
Andreas Indinger | 15.3.2023

Renewables, shares and targets 2020 in Austria

	Share AT 2020 (%)	Energy 2020	Target AT 2020 (%)
RES Total	**36.5**	**115 TWh**	**34**
RES-Electricity	78.2	55 TWh	
RES- Heating and Cooling	35.0	55 TWh	
RES -Transport	10.3	5 TWh	10

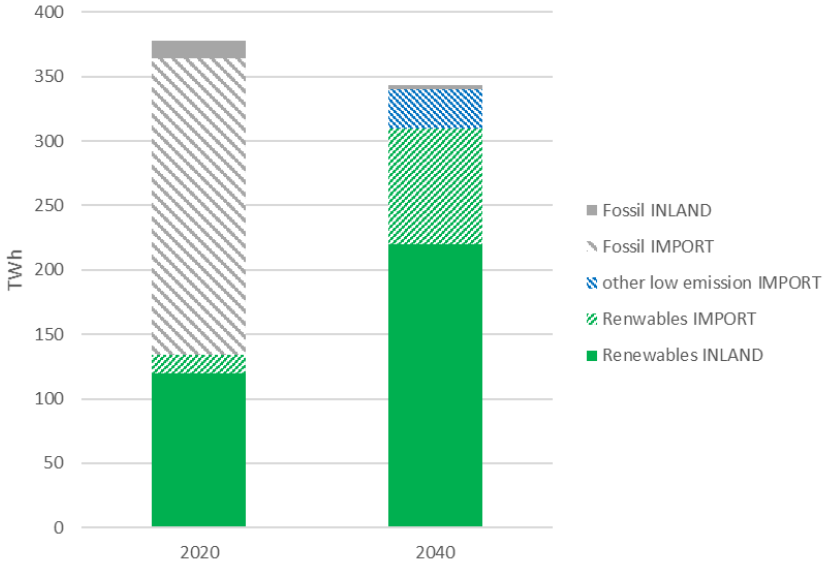


Gross final energy consumption, Source: EUROSTAT SHARES (2022)

see also Publications: https://www.bmk.gv.at/themen/energie/publikationen/zahlen.html and https://nachhaltigwirtschaften.at/de/publikationen/erneuerbare-energie-in-oesterreich-2020.php

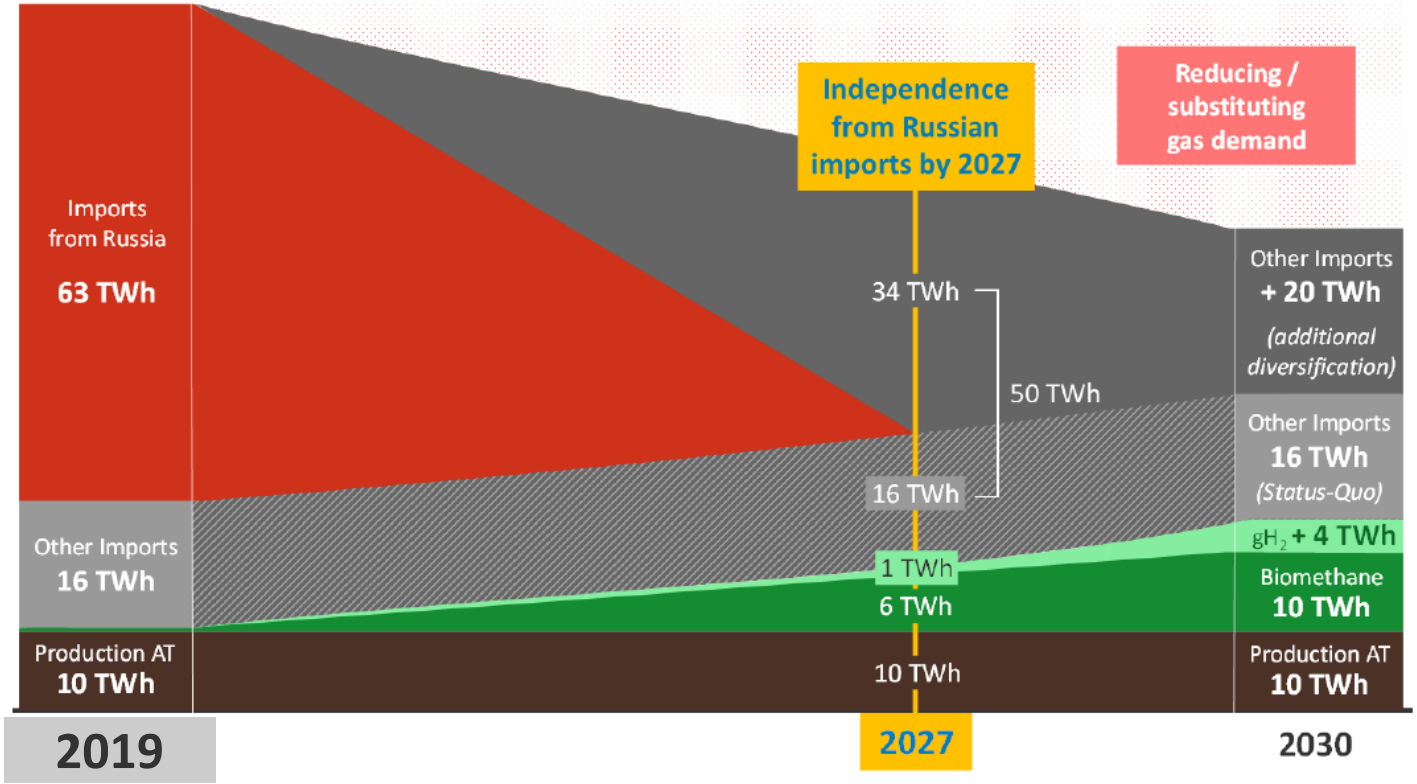
Climate neutrality by 2040

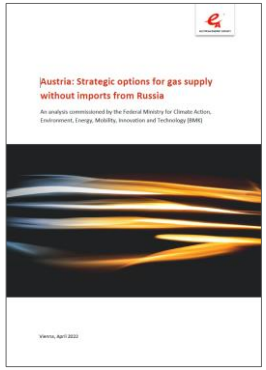
- Austria is committed to reaching climate neutrality by 2040
- Amendment to the climate protection law (last amendment was 2017) with binding reduction paths by 2040 and interim targets by 2030 is under preparation
- To achieve climate neutrality:
  - End Use: Energy efficiency first
  - Use renewable potentials with the most efficient technologies
  - (Reduce &) decarbonize imports



Data 2020: Preliminary energy balance 2020 for Austria (Statistics Austria)
Data 2040: no scenario results or targets, for illustrative issues only to show necessary developments

Austria: Strategic options for gas supply without imports from Russia (AEA Analysis, April 2022)

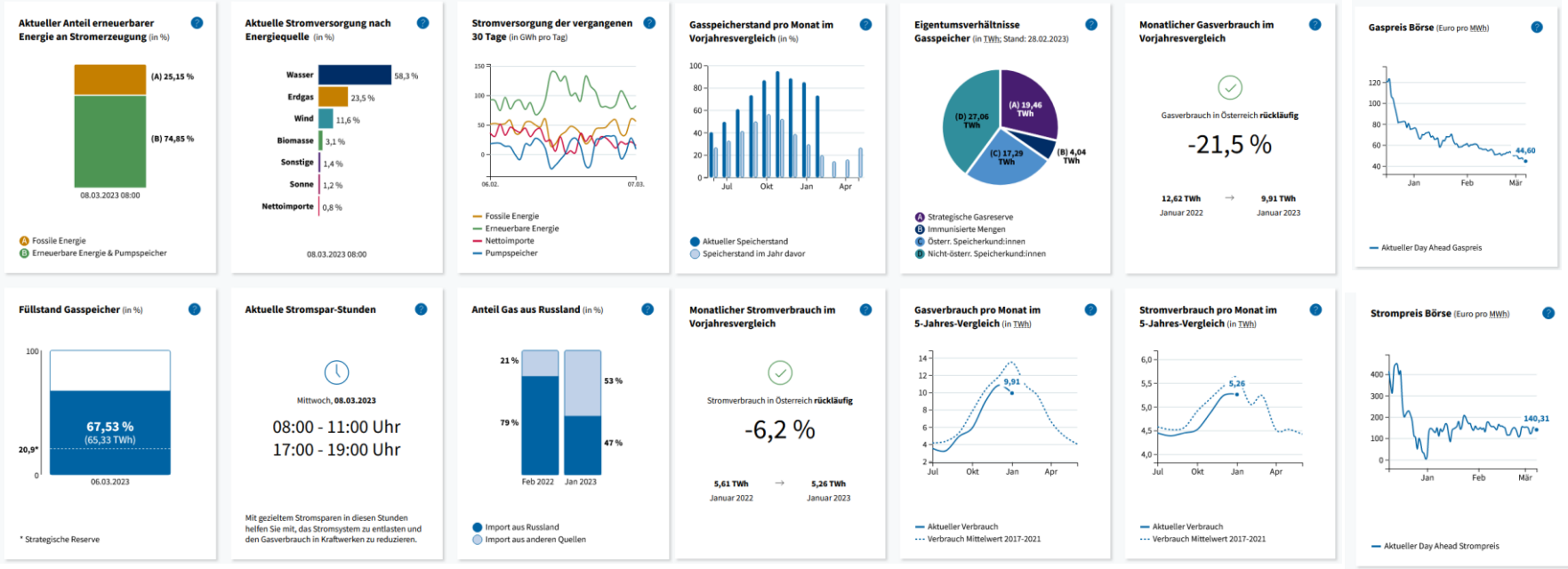




An analysis commissioned by the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology (BMK)

Download (engl.):
https://www.energyagency.at/fileadmin/1_energyagency/presseaussendungen/allg._pa/2022/04_independence_from_russian_gas_analysis_aea_bmk_2022.pdf

Austria's info portal on the energy situation



https://energie.gv.at/

100% RES electricity by 2030 and the EAG

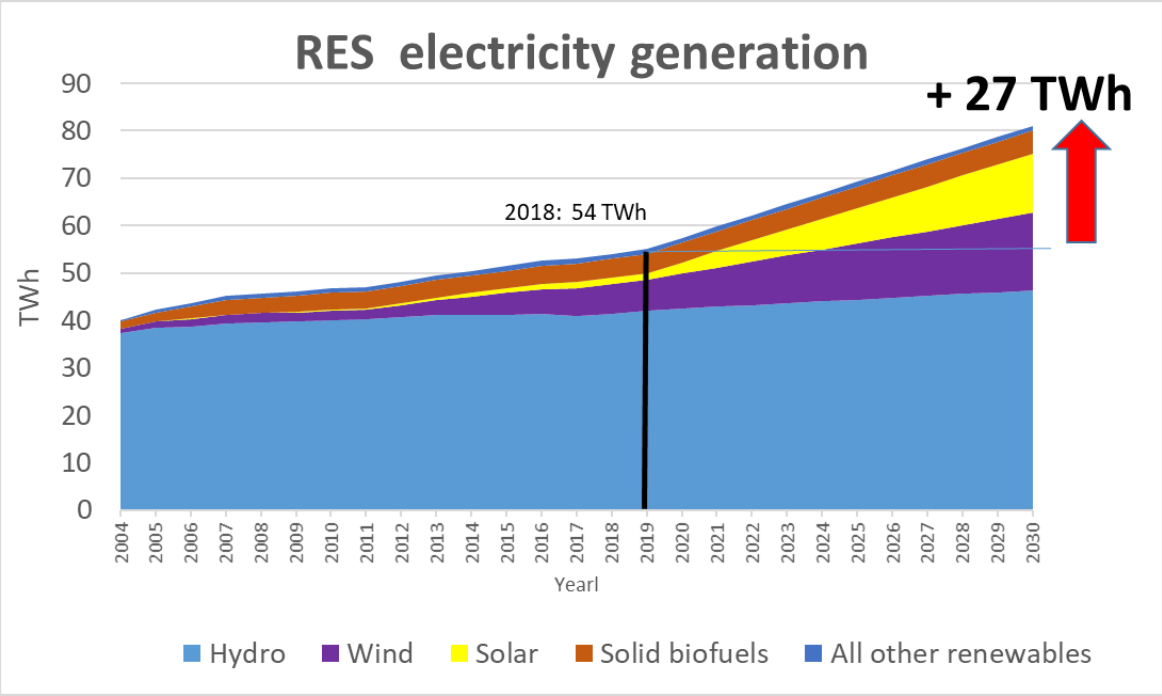
- **According to the government programme 2020 - 2024, Austria has the objective to generate 100% of total electricity consumption (national balance) from domestic renewable energy sources by 2030 (and also 5 TWh renewable gas)**
- Balancing energy and control energy for the purpose of stabilizing grid operations are not included when calculating the 100% renewable energy supply.
- **July 2021: Renewable Expansion Act EAG**
- "1 billion euro for renewables each year!"

The EAG covers a wide range of topics:

- **New support schemes for renewable electricity**
- Investment grants for hydrogen (electrolysers…) and green gas production (2 x 40 M€ per year)
- **Renewable and citizens' energy communities***
- Database for guarantees of origin
- Green gas seal
- Integrated network infrastructure planning (power and gas)
- Regulatory sandboxes for RD&D projects
- etc

*Renewable Energy Communities are defined in the Renewables Directive (REDII), Citizen energy communities in the Internal Electricity Market Directive

100% RES electricity until 2030 in Austria (national, balance)



Technology	Target 2030 – Additional generation (TWh)
Solar PV (*)	11
Wind power	10
Hydropower	5
Biomass	1
Total	27

(*) This target should be achieved, among others, through a one million solar rooftops programme

Sources: Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, eurostat (SHARES, historical values 2004-2018)

Innovative Energy Technologies in Austria
Market Development 2021

AUSTRIAN ENERGY AGENCY

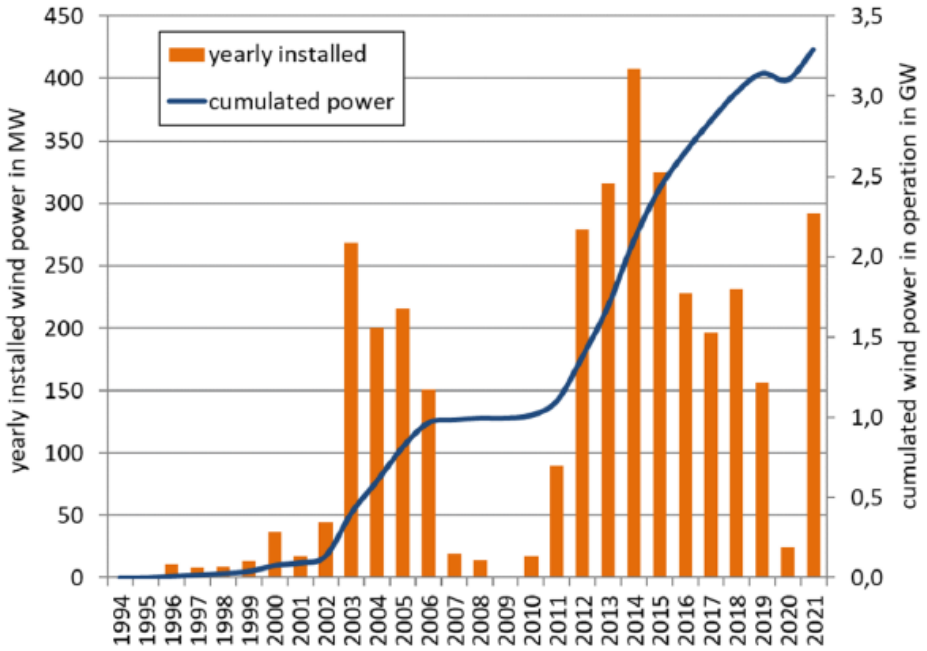
- Analysis commissioned by BMK
- Yearly reports
- Downloads: https://nachhaltigwirtschaften.at/de/iea/publikationen/markterhebungen.php

Trend	14/15	15/16	16/17	17/18	18/19	19/20	20/21
Biomass solid	↘	↘	→	↘	↗	↗	↗
Biomass liquid	↗	↘	↘	→	→	↘	(→)
Biomass gaseous	→	→	→	↘	↘	↘	(→)
Deep geothermal	→	→	→	→	→	→	→
Photovoltaics	↘	→	↗	↗	↗	↗	↗
Solarthermics	↘	↘	↘	↘	↘	↘	↘
Heat pumps	↗	→	↗	↗	↗	↗	↗
Hydro power	→	↗	↘	↗	↘	↘	↗
Wind power	↘	↘	↘	↗	↘	↘	↗

Project team

FH University of Applied Sciences TECHNIKUM WIEN · ENFOS · IG WINDKRAFT Austrian Wind Energy Association · AEE INTEC · BEST Bioenergy and Sustainable Technologies

Wind



Source: IG Windkraft

- **End of 2021 3.3 GW installed**
- 2020→2021: +6.1 %
- Wind power 2021: ca. 7.6 TWh
- Average plant size 2019: 3.1 MW, but already 4.4 MW in 2021

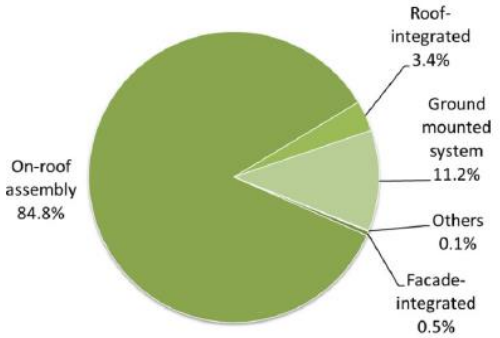
Update:

- End of 2022 3.6 GW installed
- 2022 additions 328 MW (net 289 MW)
- 2023 additional 240 MW expected

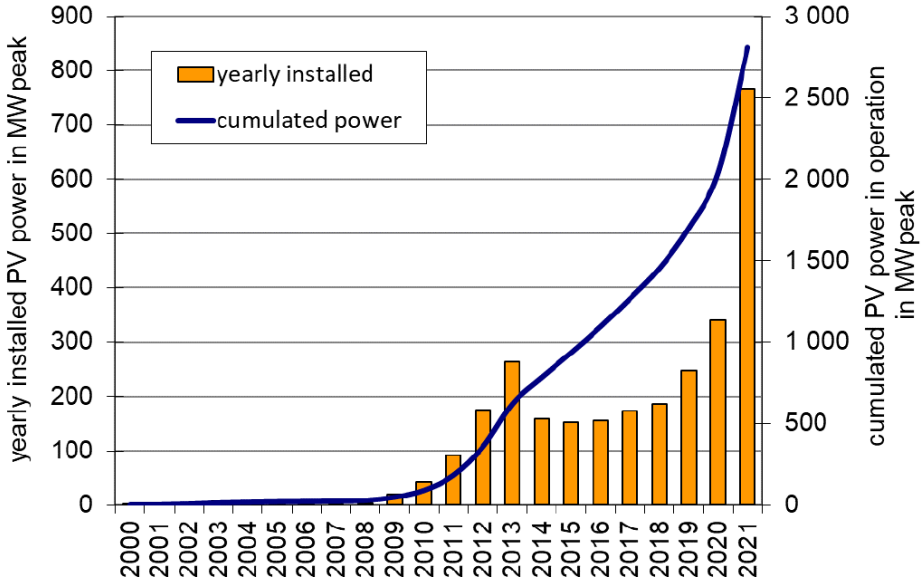
Source: Austrian Wind Energy Association

PV

- New installations 2021: 740 MW_p
- 2020→2021: +117 %
- also 2021 mainly on-roof assembly



- **2.8 GW_p installed (End of 2021)**
- 2020→2021: +36 %

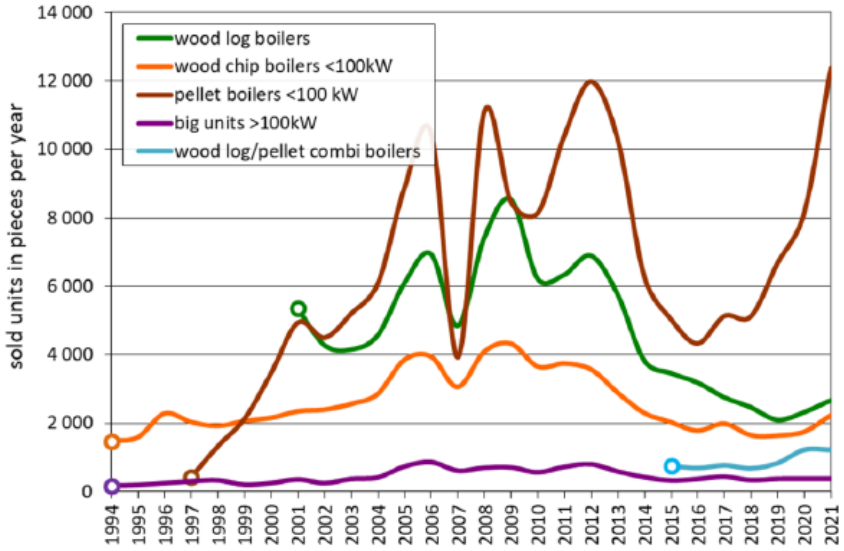


Update:

- New installations 2022 1.1-1.3 GW possible

various sources

Solid biomass – boilers: Market development 2021

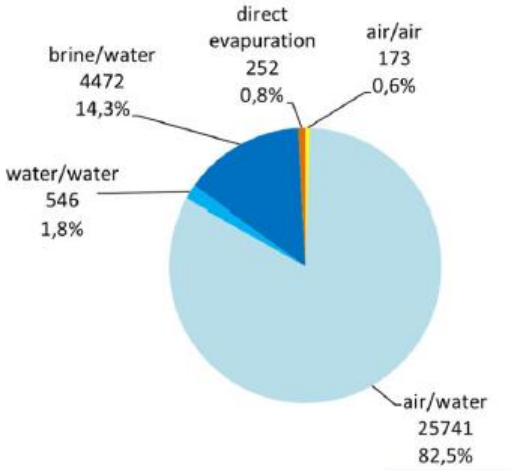


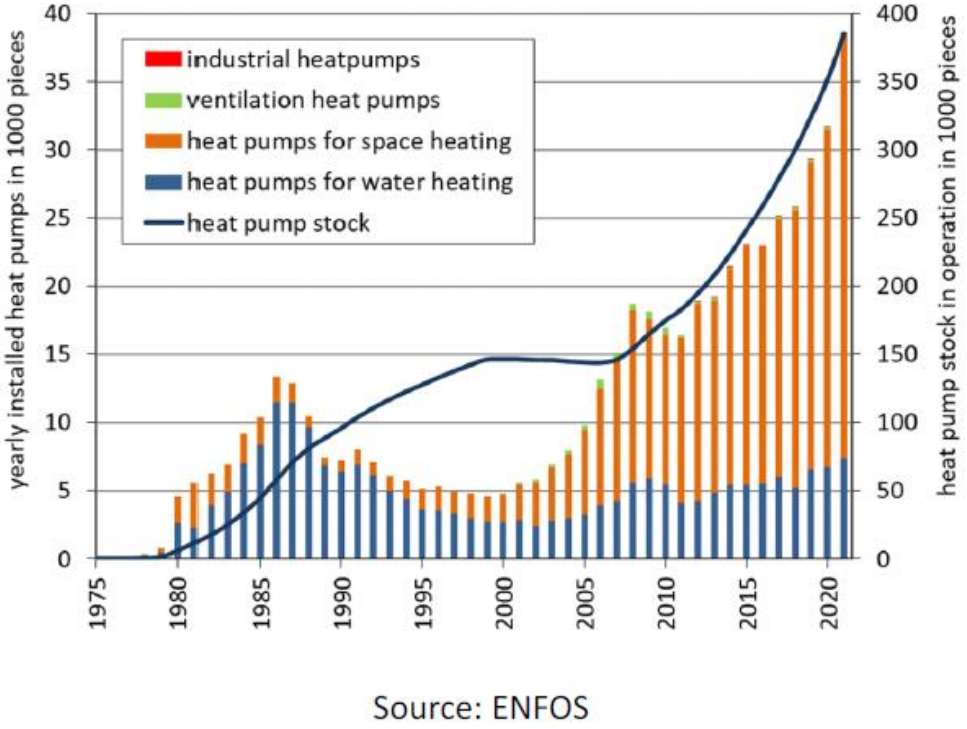
Source: BEST

2020 → 2021:	
in total 19,285 pieces	
Pellet boilers:	+50.6 %
Combined pellet boilers:	+26.0 %
Log boilers:	+14.8 %
Wood chips to 100 kW:	+28.2 %
Wood chips >100 kW:	+64.8 %
Total:	+40.0 %

Heat pumps

- New installations 2021: 38,583 heat pumps
- 2020→2021: +21.6 %
- Technology 2021: 82,5% air/water





Source: ENFOS

RES-e support system, 2022 year of change

OLD: Under the previous RES-e support system, green electricity producers received **feed-in-tariffs** for green electricity fed into the public grid based on a contract with the Green Electricity Settlement Agency (OeMAG Abwicklungsstelle für Ökostrom AG)

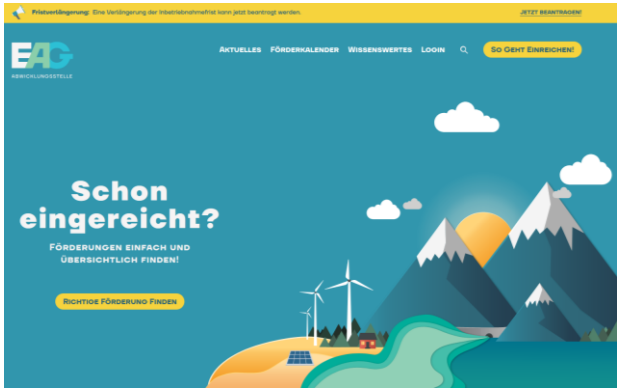
The EAG introduces a change in the support schemes for renewable electricity towards

- **investment grants** for PV and Wind < 1 MW, small-hydro < 25 MW, Biomass

or (not possible to combine)

- **market premiums**

Started 2022: Renewable Expansion Act Settlement Agency
https://www.eag-abwicklungsstelle.at/



EAG investment grants for PV 2022

Regulation 6 April 2022, some adaptions later

2022: 300 (originally 240) Million Euros, 3 resp. 4 calls

PV < 10 kWp: **285 Euro/kWp fix, fist come – first serve**

10 - 20 kWp: **max.** 250 Euro/kWp (fixed tariff 2023!)

20 - 100 kWp: **max.** 180 Euro/kWp

100 - 1.000 kWp: **max.** 170 Euro/kWp

Combination Power-Storage + PV: 200 Euro/kWh

Storage: 0.5 kWh per kWp required, max. 50 kWh funded

Grant: maximum 30% of necessary & applicable investments

Special requirements for ground mounted systems

25% discount for agro-PV

Bonus of 30% for innovation (building integration, floating PV…)

Already some changes, Regulation for 2023 expected this March

Category (kWp)	21.4.	21.6.	23.8.	18.10.	Total (M€)
<10	40	60	40	10	**150**
10-20	20	10	30	10	**70**
20-100	20	0	10	10	**40**
100 – 1,000	20	0	10	10	**40**

Category (kWp)	applied (MWp)	funded (MWp)	funded storage (MWh)	cut-off price (€)
<10	241.0	25.8	15.5	-
10-20	146.6	38,6	25.8	210 €
20-100	180.0	71.3	60.2	145 €
100 – 1,000	1,849.1	165.5	6.7	97 €

source: https://www.oem-ag.at/de/neues/

Market premium system

The market premium is aimed at compensating for the difference between the production costs of electricity from renewable sources and the **average** market price (reference market value, published every month) for electricity – over a period of 20 years.

Granted as a subsidy for marketed electricity from renewable sources that is actually fed into the public electricity grid and for which guarantees of origin have been issued.

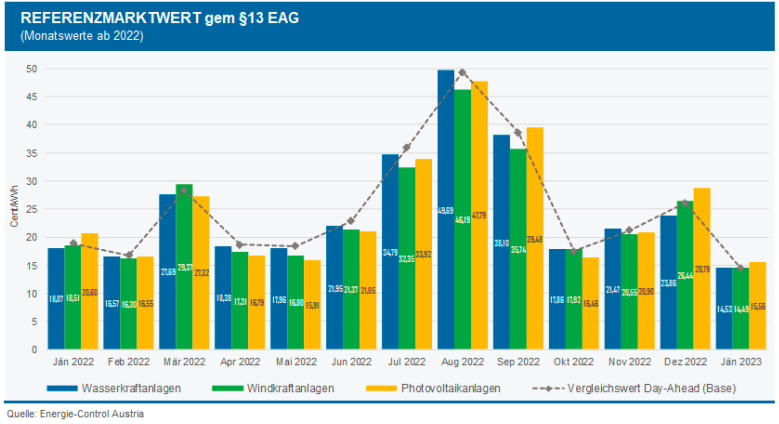
The plant operator must take care of the sale of the generated electricity (e.g. PPA, < 500 kW: operator is entitled to make a request to the balance group coordinator to assign an electricity trader).

Dedicated cases during periods of high market prices: plant operator has to “pay back” 2/3 of reference market value minus bidding price.

Zero premium in periods with negative market prices etc.

Reference market value in January 2023:

- for hydropower plants at 14.53 cents/kWh
- for wind power plants 14.49 cents/kWh
- for PV plants 15.56 cents/kWh



Quelle: Energie-Control Austria

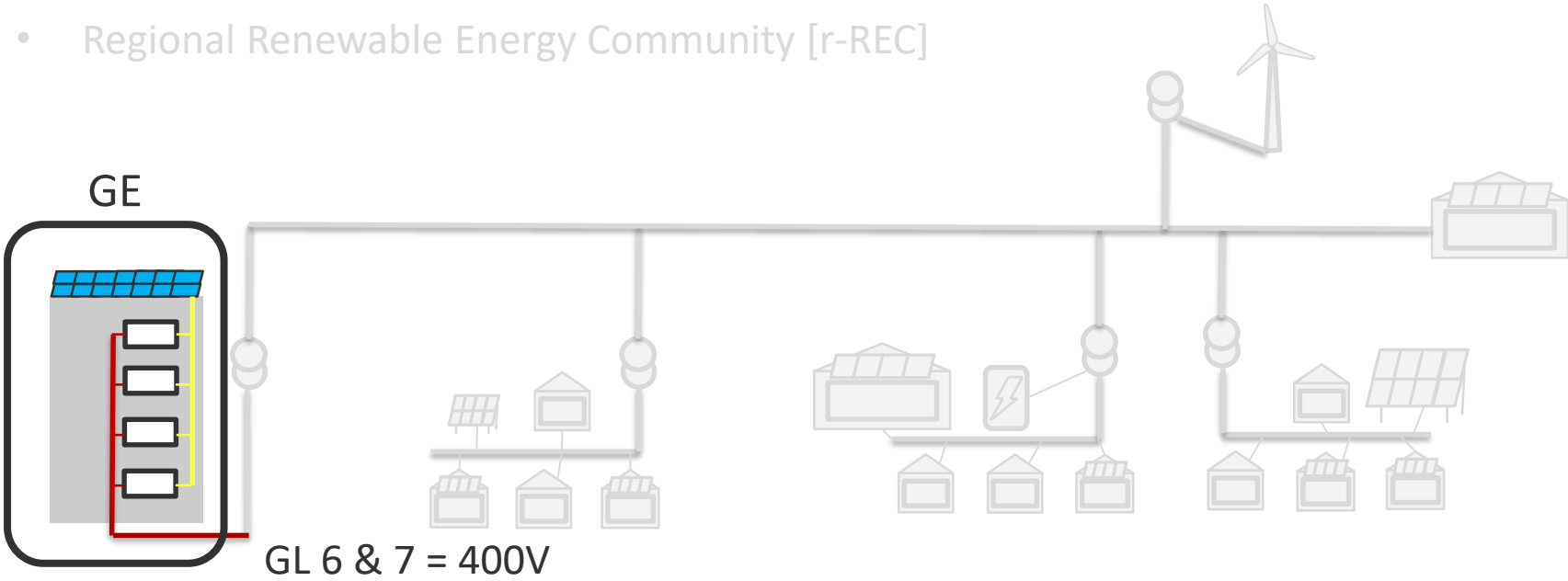
Market premium system, calls

Technology	first call, December 2022	year 2023	max. price for bidding 2022 and 2023 in €cent/kWh	
PV	700 MW (398 MW will be funded, lowest 5.63, average 7.37)	4 x 175 MW	9.33	-25% discount for agro PV etc.
Biomass	7.5 MW (5 MW funded)	7.5 MW	18.22	(repowered 17.47)
Wind	190 MW *(45.4 MW will be funded at 8.22 as an administrative price)*	4 x 100 MW	8.22	(standard site)
Joint Wind & Hydro	20 MW (0 MW applied)	20 MW	8.50	

Renewable Energy Communities in Austria

- Jointly acting renewables self-consumers [GE]
- Local Renewable Energy Community [l-REC]
- Regional Renewable Energy Community [r-REC]

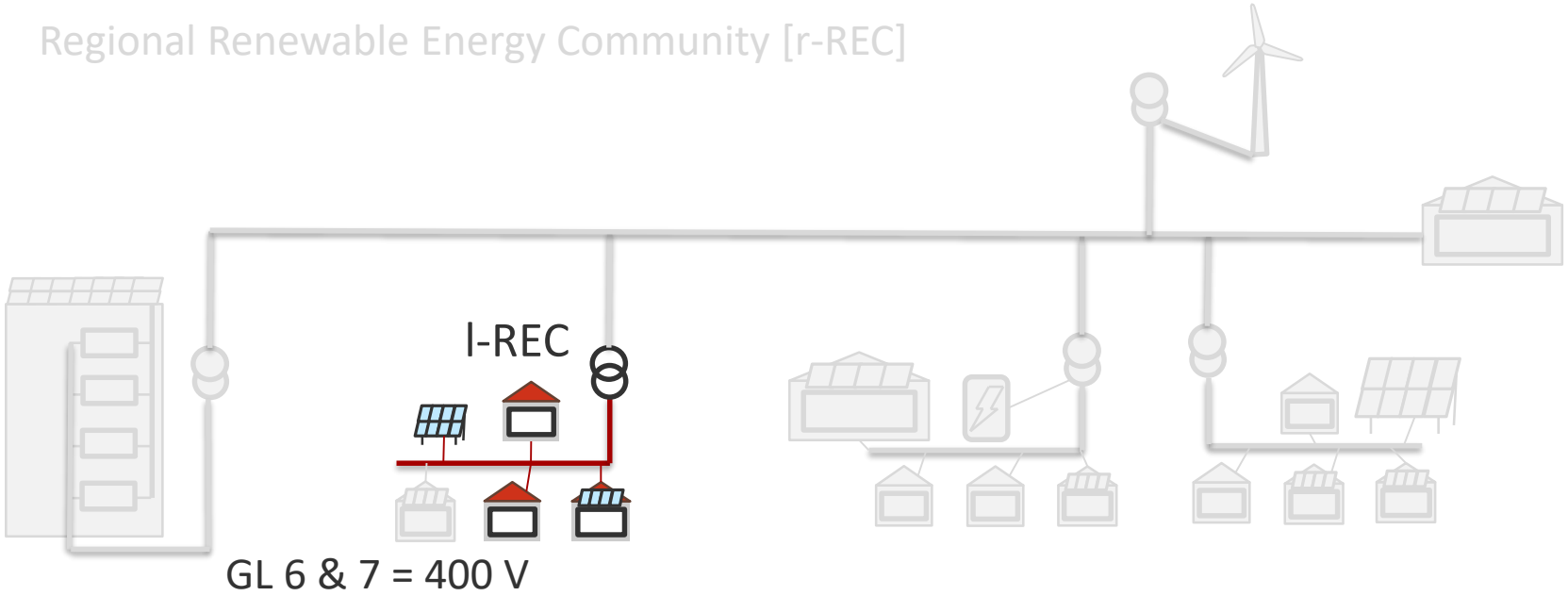
already possible since 2017 for electricity



RECs in Austria

- Jointly acting renewables self-consumers [GE]
- Local Renewable Energy Community [l-REC]
- Regional Renewable Energy Community [r-REC]

NEW from 2021 on: produce, store, consume and sell power, heat and gas



RECs in Austria

Source: https://energiegemeinschaften.gv.at/

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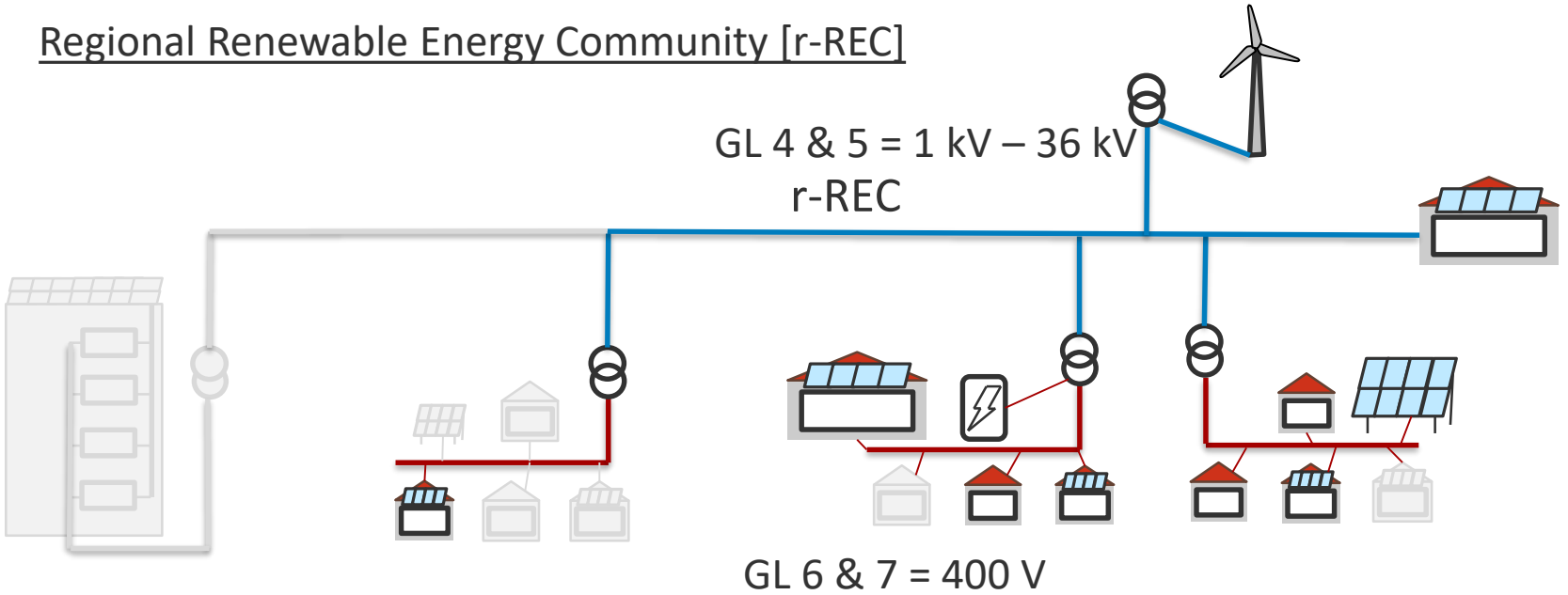
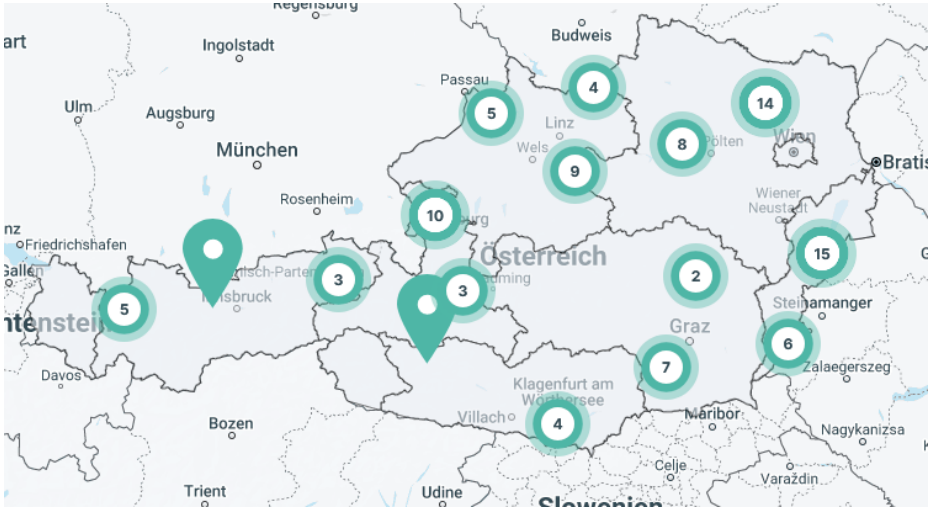


RECs in Austria



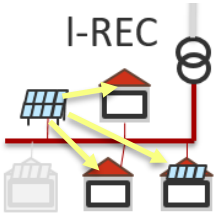
Austrian Coordination Body for Energy Communities
https://energiegemeinschaften.gv.at/

Research projects, innovation …

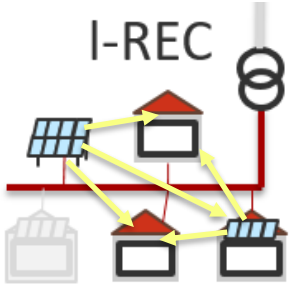
other type of ECs: ***Citizens' Energy Communities*** *limited to electricity, but not limited to renewables and GL4: so all Austria possible*

Phases of roll-out of RECs in Austria

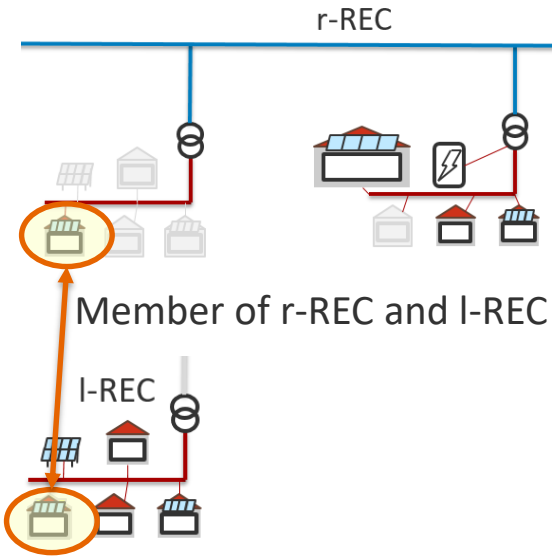
2021: One RES per Customer



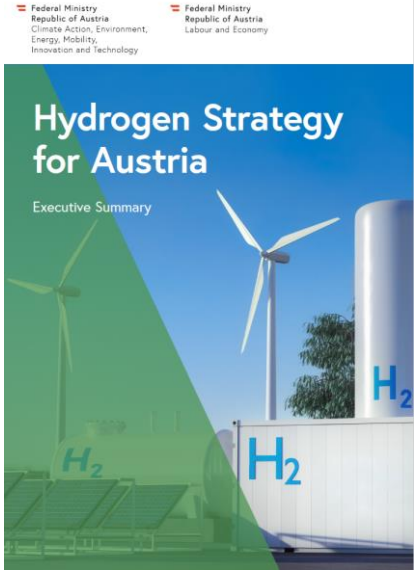
2022: Multiple RES per Customer



2024: One Customer can participate in multiple ECs



Hydrogen Strategy, published in June 2022

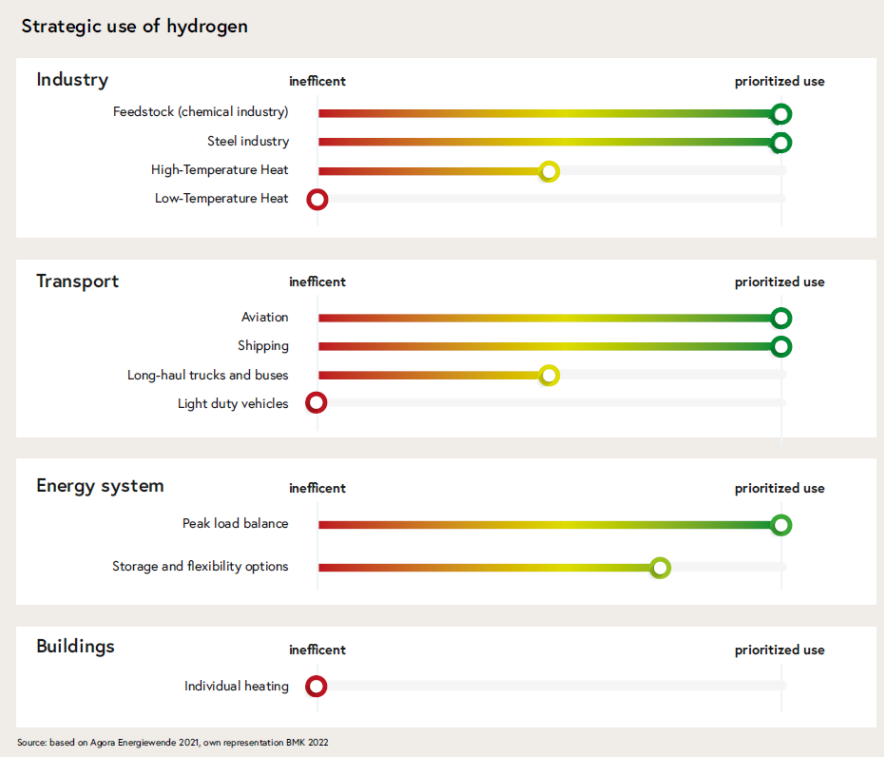


Targets of the hydrogen strategy for Austria

- **Replacing** fossil-based hydrogen with climate neutral hydrogen in energy intensive industries: 80 % until 2030
- Installation of **1 GW electrolyser capacity by 2030**
- Creation of a **supporting framework** for the production of renewable hydrogen
- Establishing the production of hydrogen as an **integral part of the energy system**
- Development of a targeted **hydrogen infrastructure**
- **Enhancing international partnerships for climate neutral hydrogen**
- Strengthening the **innovation and technology potential** in Austria through focused development of hydrogen-technologies

see: www.h2austria.eu

Hydrogen Strategy, Priorities



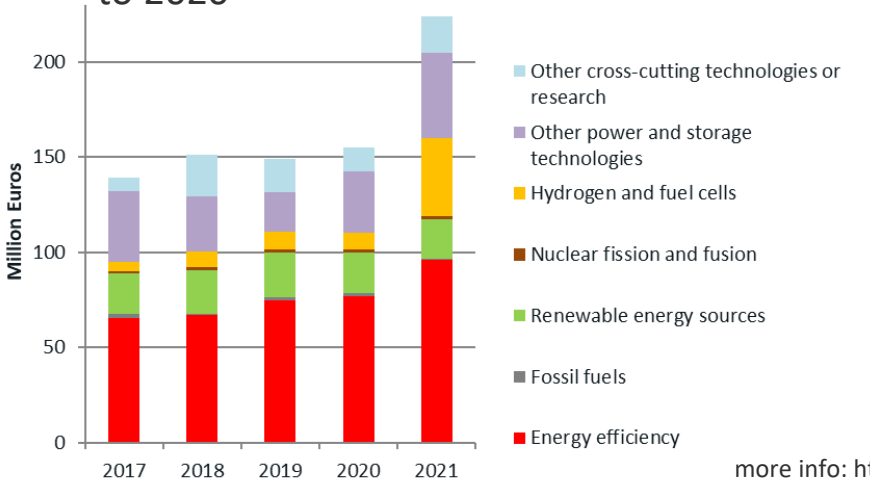
Source: Figure 3, Hydrogen Strategy for Austria

Coming …

- **Renewable Gas Law** under public consultation (7,5 TWh till 2030, Quota system…), service point already established https://www.erneuerbaresgas.at/
- (First) **Austrian Integrated Grid Infrastructure Plan** (ÖNIP), expected summer 2023
- **Investment Subsidies Regulation for Gas** under consultation
- **Investment Subsidies Regulation for Hydrogen** under preparation
- **Renewable Heat Law** under consultation
- Amendment to the **Climate Protection Law**
- **Renewable Expansion Acceleration Act**
- etc.

Public R&D-Expenditures AT

- About 1,200 projects and activities of publicly funded energy-related RD&D registered in Austria
- 2021: 224.1 million euros
- Increase of 68.9 million euros or 44.4% compared to 2020



Ranking 2021	Sub-topic	Expenditures 2021 (in million euros)
1	Hydrogen	31,8
2	Hybrid and electric vehicles	29,9
3	Energy storage	27,8
4	Smart grids	17,3
5	Energy efficiency in industry	15,0
6	Smart buildings	15,0
7	Smart cities and communities	13,3
8	Fuel cells	9,3
9	Biofuels	8,5

more info: https://nachhaltigwirtschaften.at/de/iea/publikationen/energieforschungserhebungen.php

The focus initiative Energy Transition (“Energiewende”)

- Responsible ministry: BMK, there are 4 focus initiatives in total (energy transition, mobility, circular economy, climate neutral cities)
- The focus initiative combines **all relevant thematic areas in innovation** that are key enablers for a successful energy transition
- Among others, mobility, digital technologies, (satellite) data, photonics as well as energy production and use are key areas of the focus initiative
- The first flagship initiative will fund “100% renewable-energy real labs” in Austrian regions (“100% Erneuerbare-Energie-Reallabore”)

Bundesministerium
Klimaschutz, Umwelt,
Energie, Mobilität,
Innovation und Technologie

MISSION INNOVATION AUSTRIA

100%-Renewable-Energy Real labs

Testing and Developing Today in Tomorrow's Energy System

Call open till April 2023

https://www.ffg.at/Reallabore_AS2022

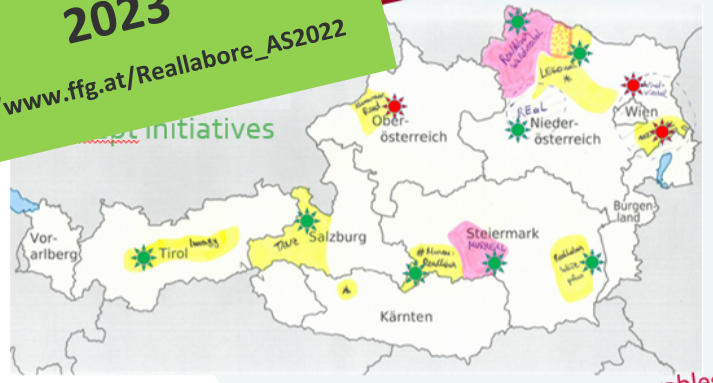
- **Output**: Prototype model solutions for **100% renewable energy (electrici… heating & cooling, etc.)** in application (industrial region, wind region, agricultural region, ...).

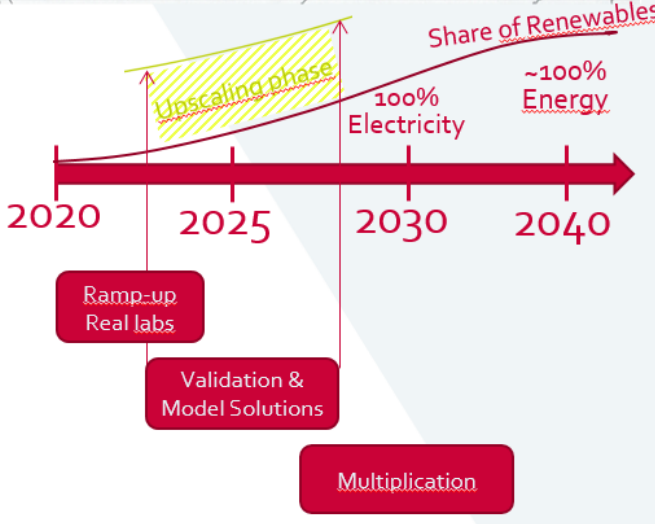
- **Activity**: Austria-wide innovation network with approx. **5 real labs [scale: city district(s), district(s)].** The total budget of the call amounts to 20 Mio. €.

- **Intervention goals**: **Validation** in real life application, targeted **innovation impulse**, **development impulse** for specific regions, **supraregional knowledge building**

- **Areas of Action**:
  - **Interaction of components in complete energy system solutions** (application plants, buildings and neighborhoods, commercial operations, energy communities, grids, storage, etc.). Planning, implementation and operation.
  - **Cross-sector** and **sector coupling** (electricity, heating & cooling, mobility, ...).
  - **Flexibility** and **resilience** in the energy system
  - **Emergence** - system properties more than properties of isolated elements.

- **Levels**: technical / economic & organizational / transition





Program Evaluation IEA Research Cooperation

Period 2011-2021

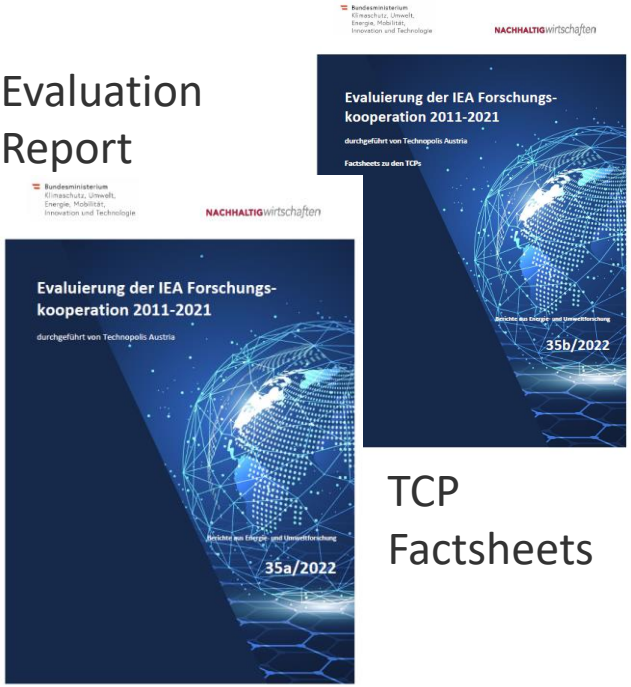
Evaluation focus:

1. program effectiveness
2. program design
3. accompanying measures

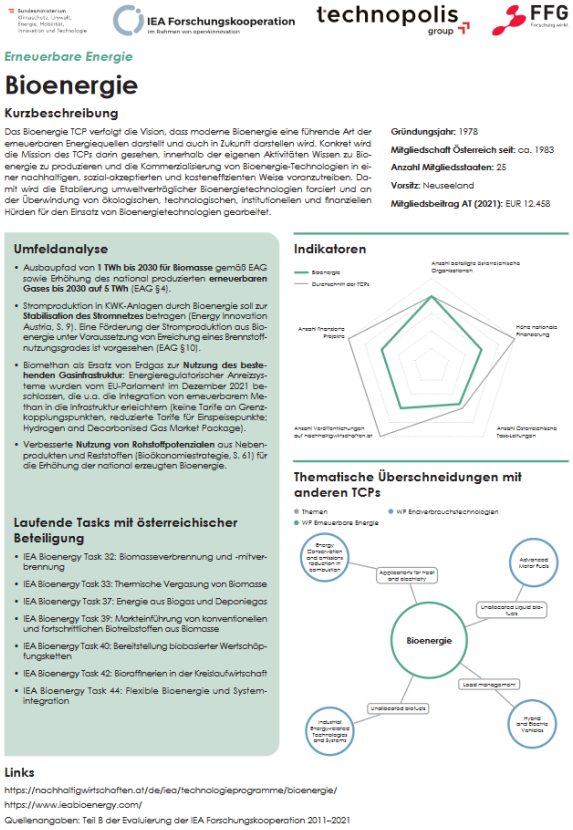
Method:

- Interviews, online survey
- Analysis of the funding data
- Evaluation of online presence

Evaluation Report



TCP Factsheets



https://nachhaltigwirtschaften.at/de/iea/publikationen/iea-evaluierung-2022.php
carried out by Technopolis Group, Executive Summary in English available

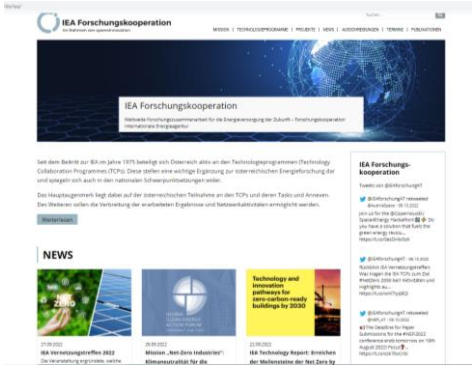
Programme Evaluation cont.

Success stories identified:

- Austrian participation in 23 TCPs (6 new TCPs in that period)
- overall budget 27.5 Mio Euro
- Projects 23.8 Mio Euro
- Supporting measures 3.7 Mio Euro
- Website (55,638 User)
- Newsletter (3,700 recipients)
- Twitter account @IEAForschungAT

Key recommendations:

- CONTINUATION of program: budget increase, yearly call, demand oriented 2ndCall
- STRENGTH is thematic width (TCPs), priority setting by selecting Tasks/ Annexes/ Leads
- PROMOTE Cross-TCP exchange
- Networking event – more direct exchange
- CONTINUATION of online presence



www.nachhaltigwirtschaften.at/iea

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Petajoule

In the podcast Petajoule, the experts of the Austrian Energy Agency will be answering questions to the energy future with guests from the energy sector.

The Austrian Energy Agency is ÖNORM ISO 50001:2011 and ISO 29990:2010 certified.