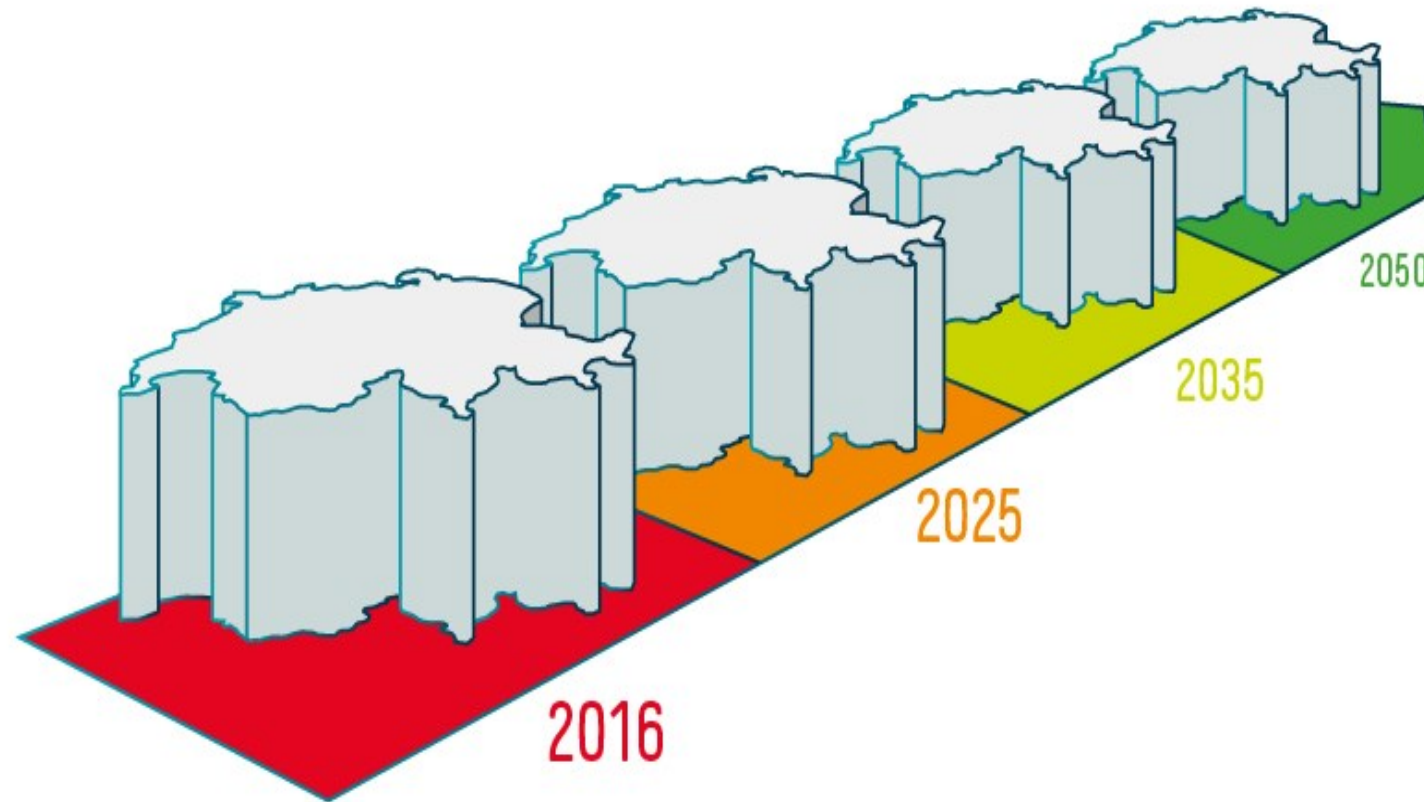




Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Bundesamt für Energie BFE
Office fédéral de l'énergie OFEN
Ufficio federale dell'energia UFE

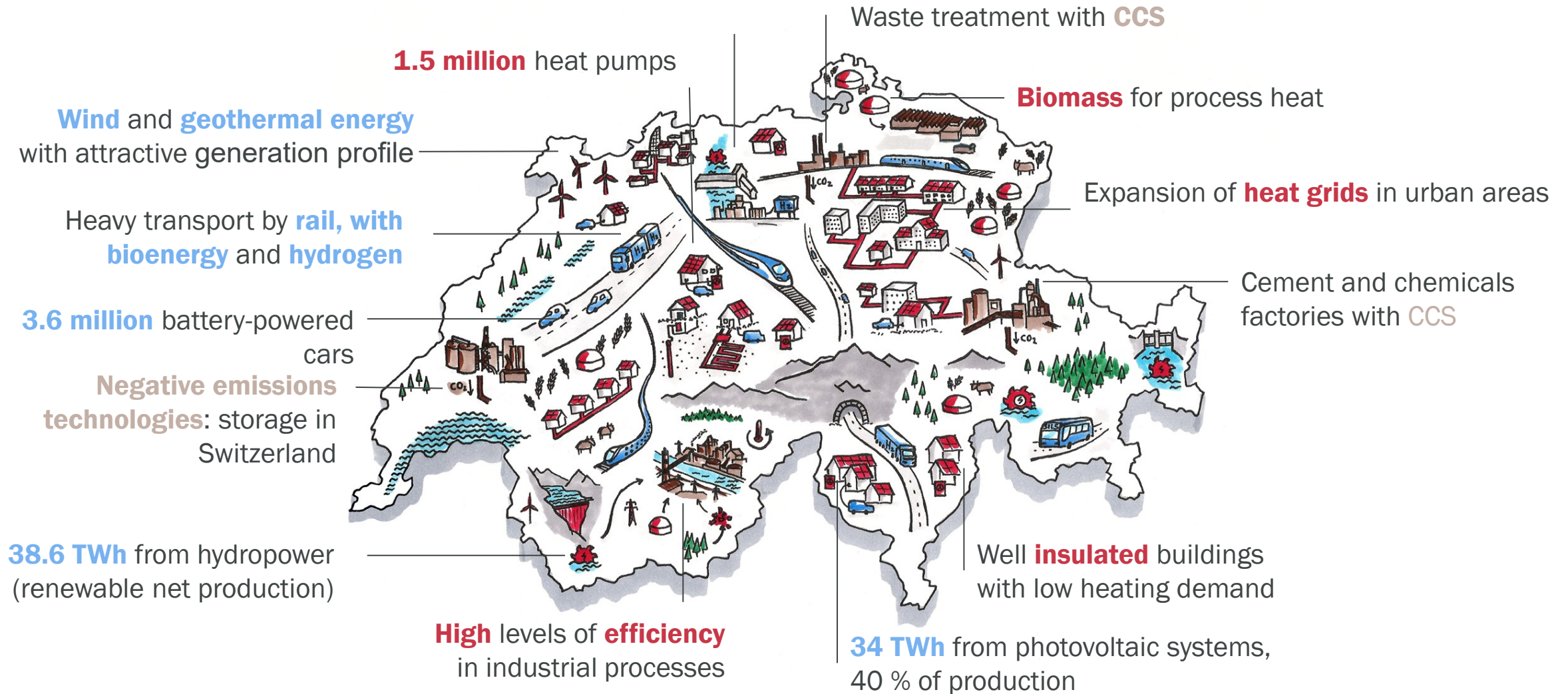


Where do we want to go (and how do we get there)?



CLIMATE-NEUTRAL SWITZERLAND IN 2050

Hydrogen production at run-of-river sites (7 PJ)

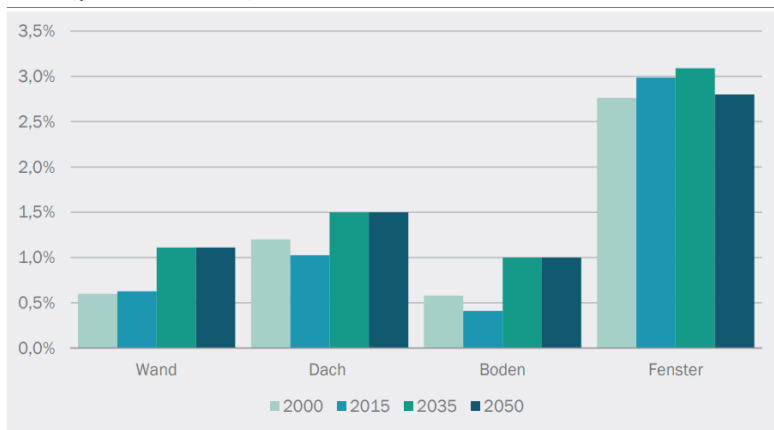


© Graphic: Dina Tschumi, Prognos AG / TEP Energy GmbH / INFRAS AG 2020



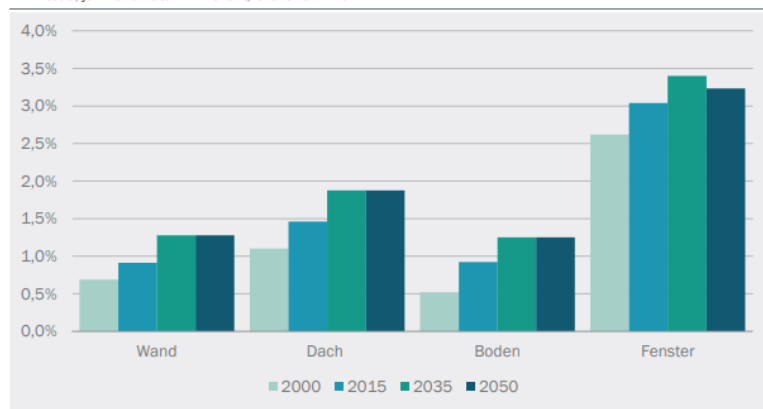
ENERGY PERSPECTIVES 2050+ REFURBISHMENT RATE

Abbildung 69: Energetische Erneuerungsraten nach Bauteilen in Ein- und Zweifamilienhäusern im Altbau, jährliche Raten in Prozent, Szenario ZERO



Quelle: Prognos AG, Ex-post-Werte basierend auf (TEP Energy, 2020a, 2014) © Prognos AG / TEP Energy GmbH / INFRAS AG 2021

Abbildung 70: Energetische Erneuerungsraten nach Bauteilen in Mehrfamilienhäusern im Altbau, jährliche Raten in Prozent, Szenario ZERO

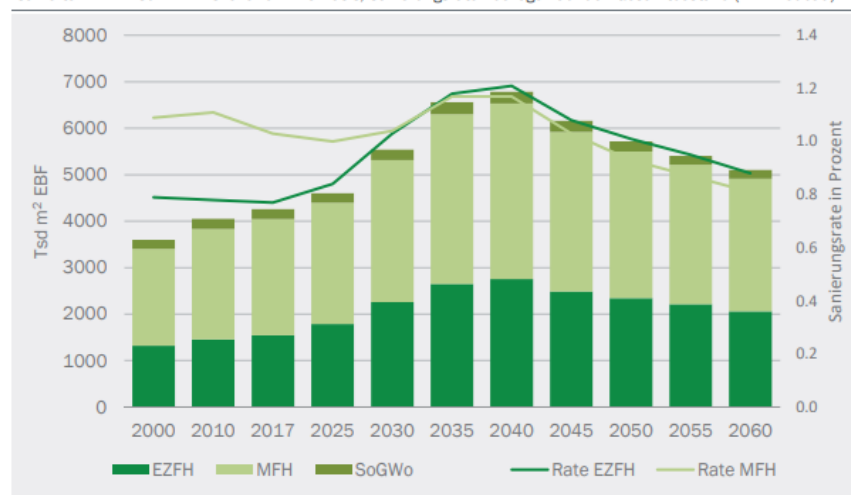


Als Vereinfachung werden für die sonstigen Gebäude mit Wohnungen die gleichen Annahmen unterstellt wie bei den MFH

Quelle: Prognos AG, Ex-post-Werte basierend auf (TEP Energy, 2020a, 2014) © Prognos AG / TEP Energy GmbH / INFRAS AG 2021

Abbildung 71: Energetisch sanierte EBF nach Gebäudetyp und Sanierungsraten

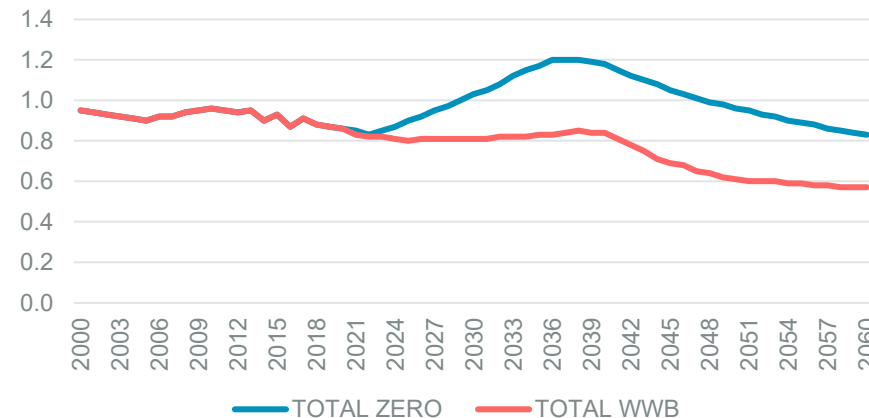
sanierte EBF in Tsd. m² im Szenario ZERO Basis, Sanierungsraten bezogen auf den Gesamtbestand (inkl. Neubau)



Quelle: Prognos AG,

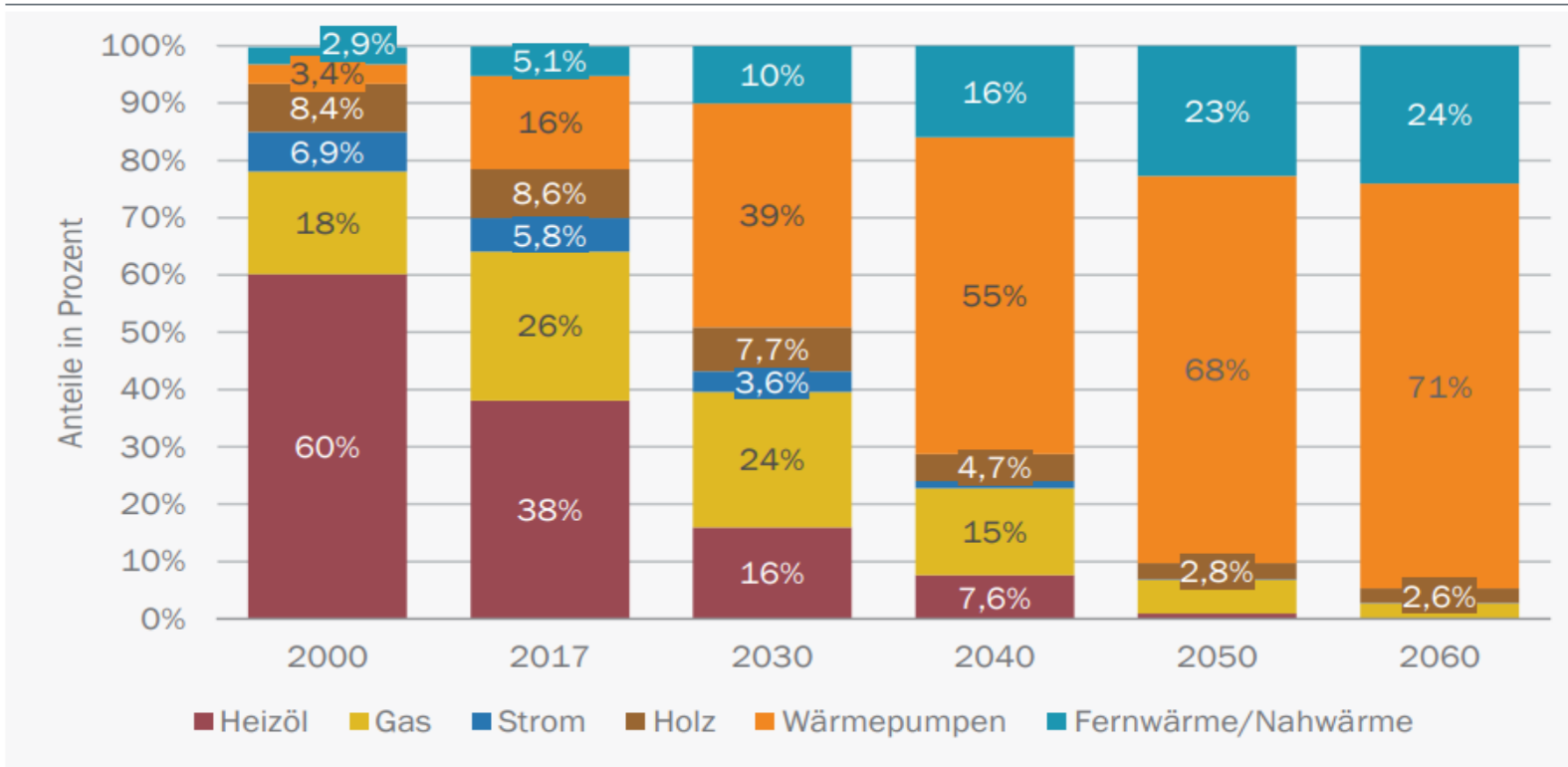
© Prognos AG / TEP Energy GmbH / INFRAS AG 2021

Refurbishment rate



ENERGY PERSPECTIVES 2050+ HEATING SYSTEMS

Abbildung 63: Szenario ZERO Basis, Beheizungsstruktur des Wohnungsbestands – alle Wohngebäude
in Prozent, bezogen auf die Energiebezugsfläche



Quelle: Prognos AG

© Prognos AG / TEP Energy GmbH / INFRAS AG 2021



FEDERAL LEGISLATION - OBJECTIVES (1/3)

Climate and Innovation Act (planned entry into force: 1.1.2025)

Reduction target (Art. 3 para. 1)

The federal government ensures that the impact of man-made greenhouse gas emissions in Switzerland **is zero by 2050 (net zero target)**, ...

Reference values in the Buildings sector (Art. 4)

Reduction in greenhouse gas emissions compared to 1990:

- **by 82 percent by 2040**
- **by 100 percent by 2050**



FEDERAL LEGISLATION - OBJECTIVES (2/3)

Climate and Innovation Act - Art. 10 Exemplary function of the Confederation and cantons

- Net zero emissions by 2040 for the central federal administration
- Consideration of direct, indirect, upstream and downstream emissions

Parliamentary initiative "Strengthening the Swiss circular economy"

- Creation of the necessary legal basis to strengthen the circular economy, reduce environmental pollution and increase the efficiency and security of supply of the Swiss economy
- Currently undergoing parliamentary consultation

[20.433 | Schweizer Kreislaufwirtschaft stärken | Geschäft | Das Schweizer Parlament](#)



FEDERAL LEGISLATION - OBJECTIVES (3/3)



Mantelerlass: binding expansion and consumption targets (Art. 2 and 3 EnG)

Binding targets for 2035 and 2050.

Accelerated and increased expansion of renewable energies.

Ambitious consumption targets despite extensive electrification (decarbonization of transport and buildings).

	2035	2050
Renewable energies without hydropower	35 TWh	45 TWh
Hydropower (net production)	37.9 TWh	37.2 TWh
Electricity consumption per person and year	- 13% compared to 2000	- 5% compared to 2000
Energy consumption per person and year	- 43% compared to 2000	- 53% compared to 2000



MONITORING ENERGY STRATEGY 2050

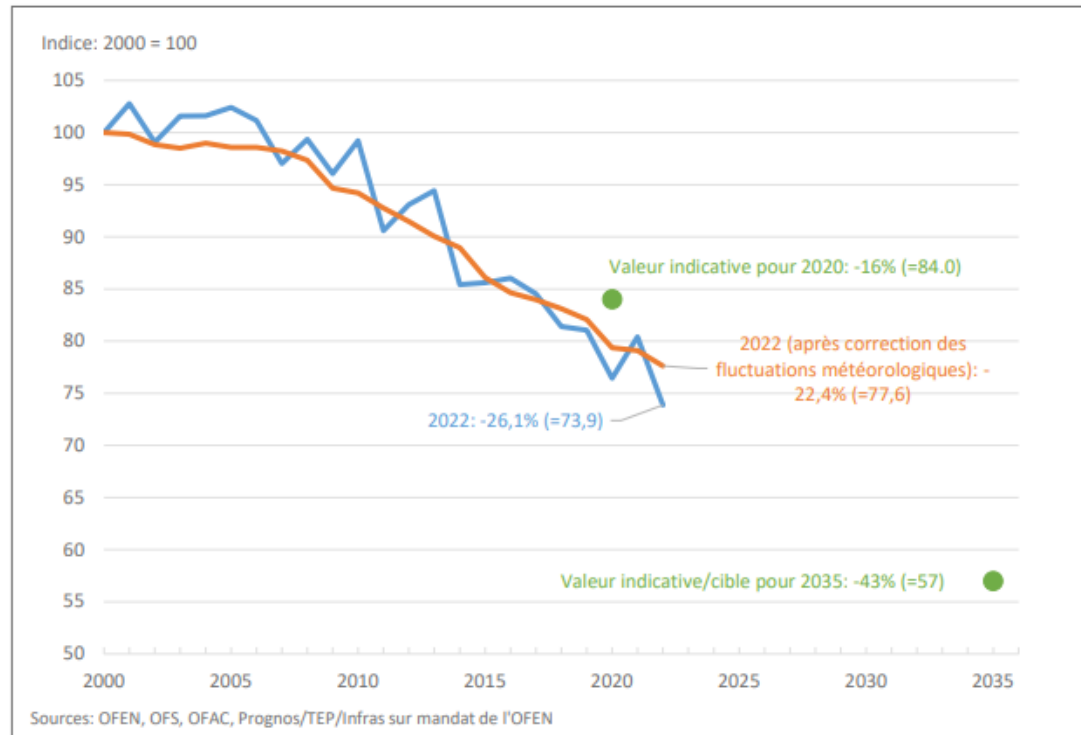


Figure 3: Évolution de la consommation énergétique finale⁶ par habitant depuis 2000 (valeurs indexées)

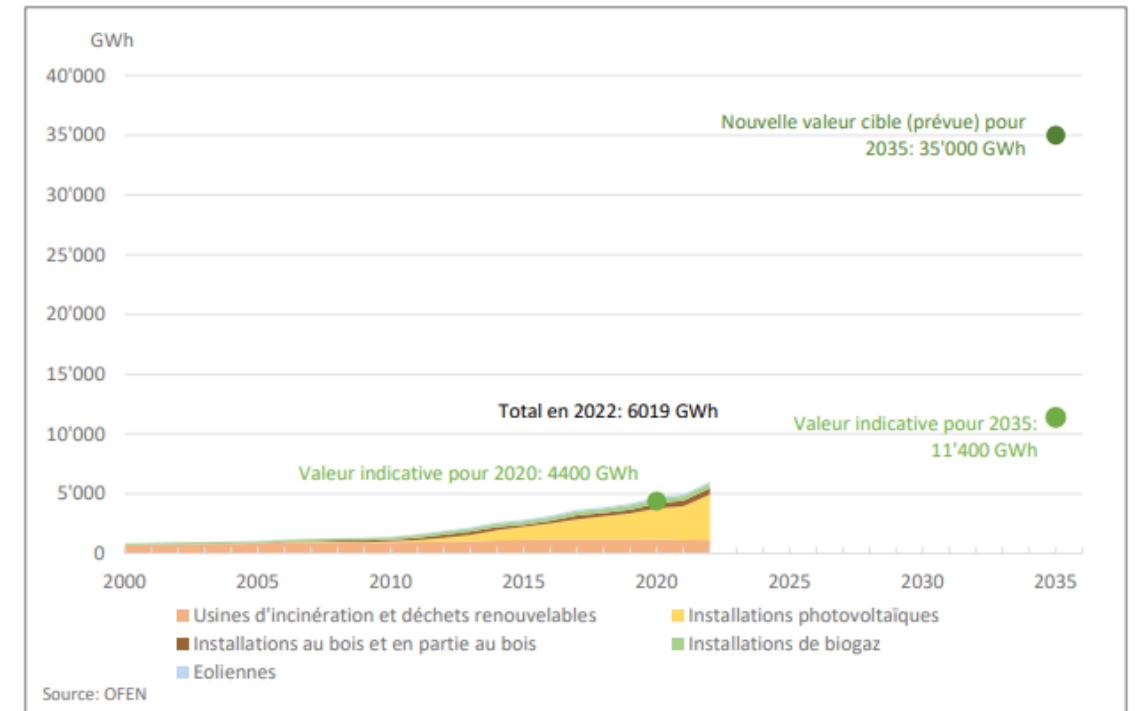
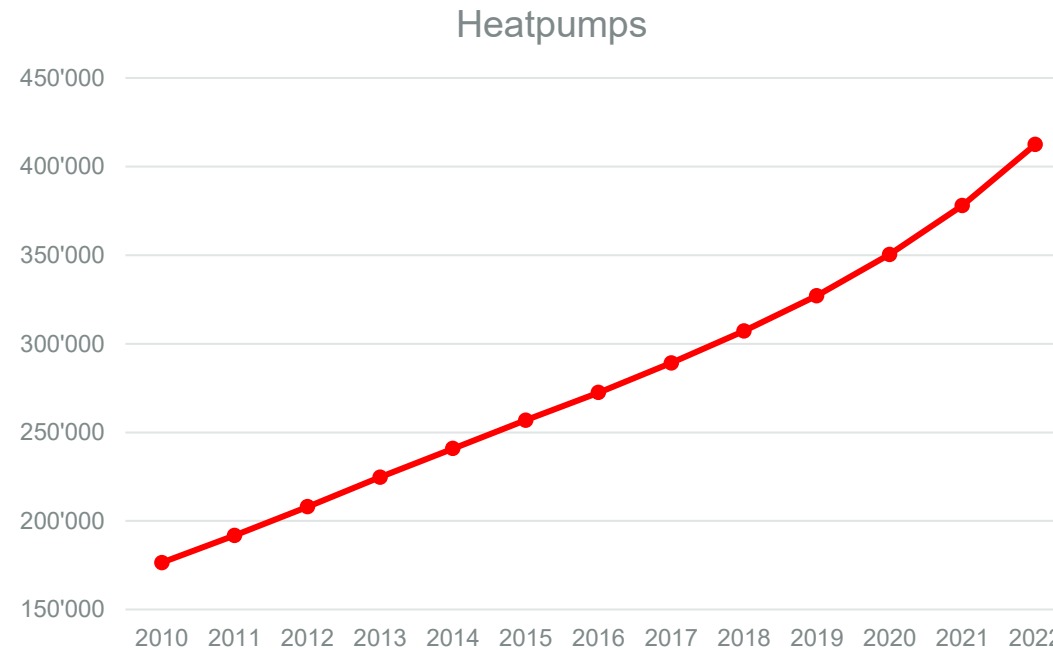


Figure 5: Évolution de la production électrique issue des énergies renouvelables (sans la force hydraulique) depuis 2000 (GWh)

Source: OFEN: Rapport de monitoring 2023 (version détaillée)



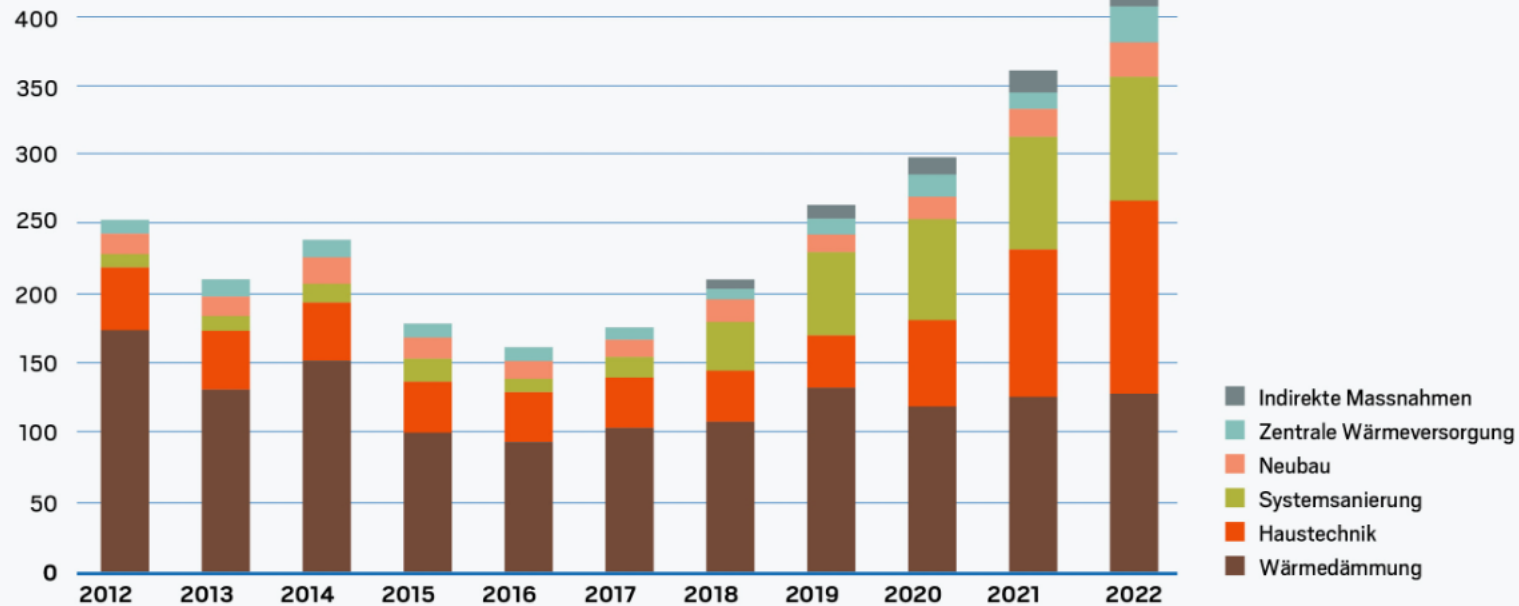
EVOLUTION OF HEAT PUMPS



Source: Schweizerische Statistik der erneuerbaren Energien, Ausgabe 2022: Detaildaten, Anhang B



BUILDING PROGRAM (WWW.DASGEBAEUDEPROGRAMM.CH)



Auszahlungen des Gebäudeprogramms (2012 bis 2022, in Mio. Fr.)



MUCH REMAINS TO BE DONE

- In total, still around **1.1 million residential buildings in Switzerland** are **in need of renovation**.
 - ⇒ With the current refurbishment rates (MISTEE), all windows will have been replaced once by around 2050, all pitched roofs by 2090 and all facades between 2060 and 2075.
- In total, around **1.1 million heating systems need to be replaced** in Swiss residential buildings: 720,000 oil heating systems, 310,000 gas heating systems and 140,000 electric heating systems.
 - ⇒ This means that till 2050, **40,000 heating systems** must be converted to renewable energies **every year. Major challenge in the higher power range (above 70kW)!**
- **Around half (!)** of building owners do not consider alternatives to fossil fuel heating systems.
- Still low level of knowledge about the cost benefits of energy-efficient buildings and renewable heating systems



CANTONAL LEGISLATION - HEATING REPLACEMENT

«New» legal framework conditions will mean that a 1:1 replacement of a fossil heating system will no longer be so easy.

MuKE n 2014 - Status of implementation of renewable heat for heat generation replacement

Share EE	Buildings affected	Cantons (as of Nov. 2023)
100 %	All	ZH, BS, GE, UR*
100 %	Residential buildings	GL, NE
20%	All	ZG*
20%	Residential buildings	FR, SH, AR, VS*
10%	Residential buildings	BE, LU, SZ, OW, NW, BL, AI, SG, GR, TG, TI*, JU
Still open		AG, SO, VD

* not yet in **force**
(Source: www.endk.ch)



PROMOTION / SUBSIDIES

Federal and cantonal **building program** (www.dasgebaeudeprogramm.ch)

- CO₂ -G Art. 34 Reduction of CO₂ emissions from buildings
- *¹ One third of the revenue from the CO₂ levy, up to a maximum of CHF 450 million per year, is used for measures to reduce CO₂ emissions from buildings in the long term, including reducing electricity consumption in the winter months. To this end, the Confederation grants the cantons global contributions to measures in accordance with Articles 47, 48 and 50 of the Energy Act of September 30, 2016 (EnG).*

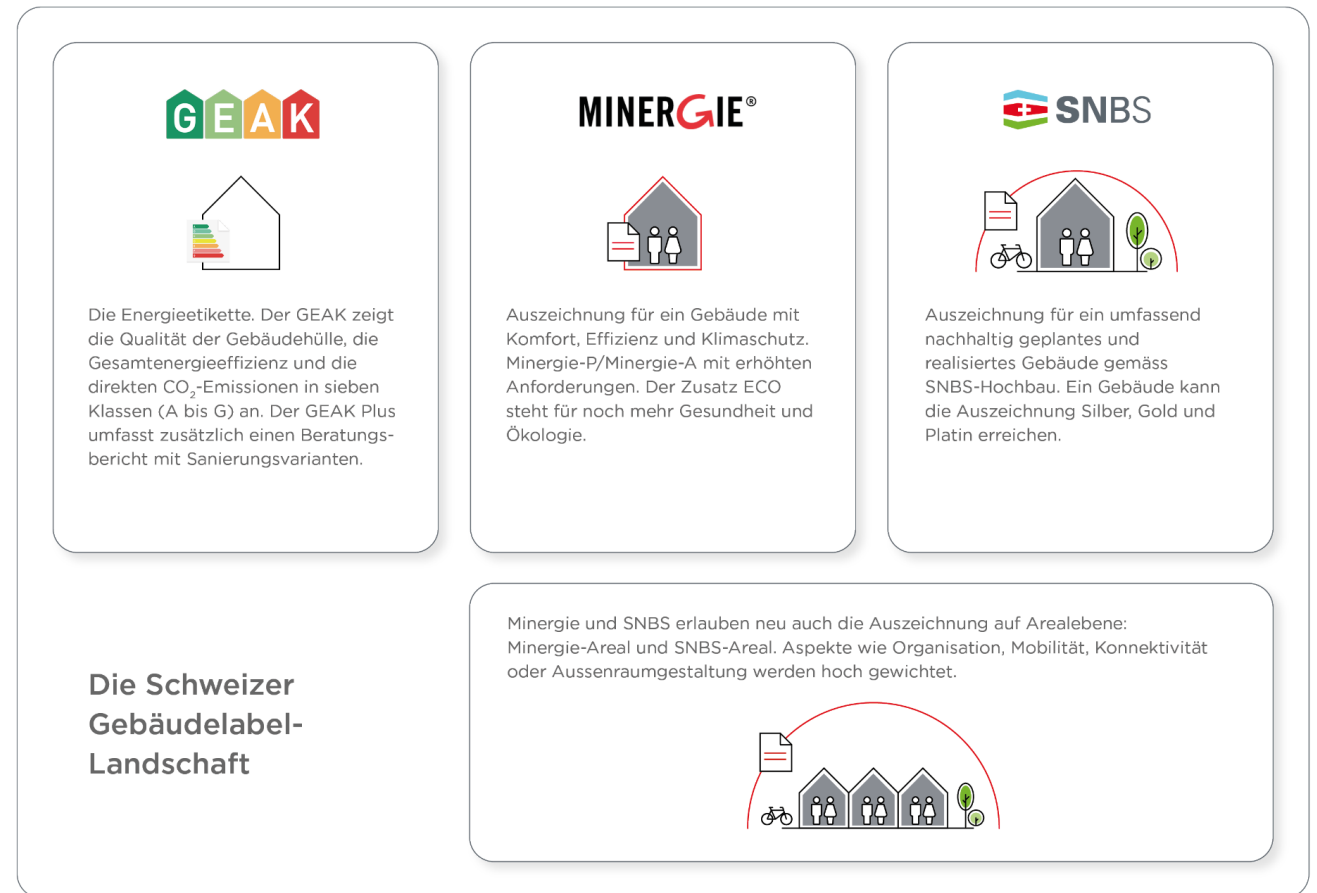
Climate and Innovation Act - excerpt on amendment to Art. 50a EnG

- **Stimulus program** for the replacement of **heating systems and energy efficiency measures**
- *¹ As part of an impulse program, the federal government is promoting the replacement of fossil-fuelled heating systems and stationary electric resistance heating systems with heat generation from renewable energies and measures in the area of energy efficiency with an amount of CHF 200 million per year for a limited period of ten years.*



VOLUNTARY MEASURES (SWISSENERGY)

- Program «renewable heating» (erneuerbar heizen) with free advice on heating replacement (Impulsberatung zum Heizungersatz)
- Energy and Health (legionellae etc.)
- Labels: Building labels Switzerland (Gebäudelabels Schweiz)
- Tenants and landlords: Renovabene and Locabene
- Various projects, primarily in the field of building technology





CONCLUSION

- Promissing developments
 - However, much remains to be done
 - How to rise to the challenge?
- Input from research
- Knowledge transfer to decision-makers!