

International experience with Renewable Heat Technologies (centralized and individual)



International Trends and Technologies with Renewable Heating

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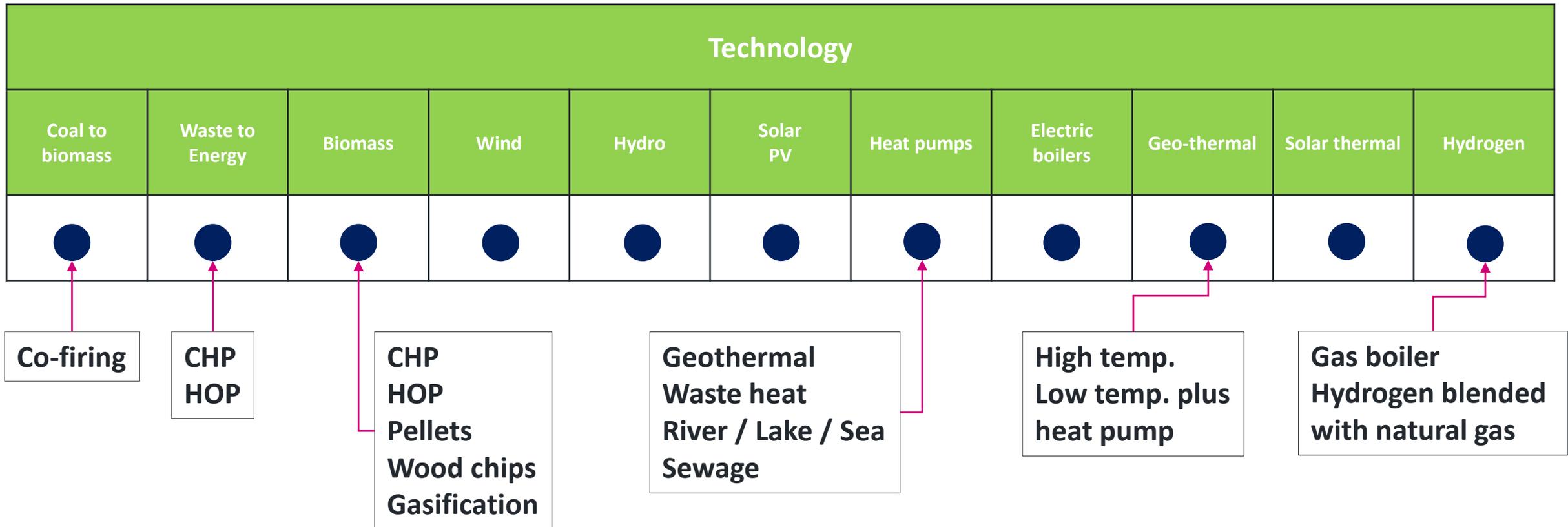
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TECHNOLOGIES - OVERVIEW

Sector	Technology										
	Coal to biomass	Waste to Energy	Biomass	Wind	Hydro	Solar PV	Heat pumps	Electric boilers	Geo-thermal	Solar thermal	Hydrogen
District heating	●	●	●	●	●	●	●	●	●	●	●
Budget entities / Institutions / Public buildings			●			●	●	●	●	●	●
Indv. houses			●			●	●	●	●	●	●

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TECHNOLOGIES - DISTRICT HEATING



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DISTRICT HEATING – TECHNOLOGY OPTIONS*

- Rebuilding large coal power plant to biomass;
- WtE CHP and HOP plants;
- Biomass CHP and HOP plants;
- Stirling engines, gasified biomass;
- Wind Turbines onshore;
- Photovoltaics;
- Heat pumps;
- Electric Boilers;
- Geothermal district heating; and
- Solar District Heating

*Note: Please refer to the [Catalogue of Catalogue of Renewable Heat Supply Technologies](#) for more information

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INTERNATIONAL TRENDS – DISTRICT HEATING

☐ Solar powered district heating



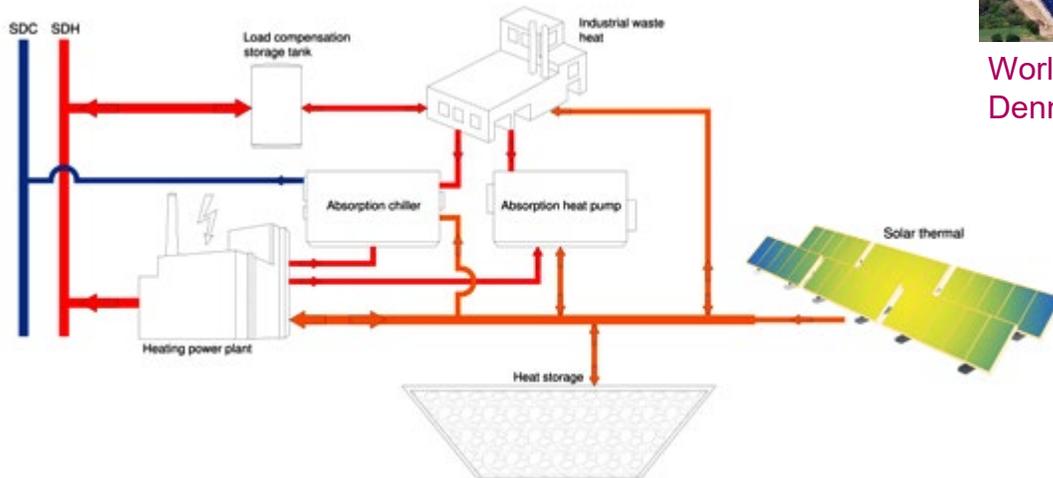
World's biggest solar district heating, 110 MW, Denmark, 2016



15 MW Solar DH plant, Latvia, 2019

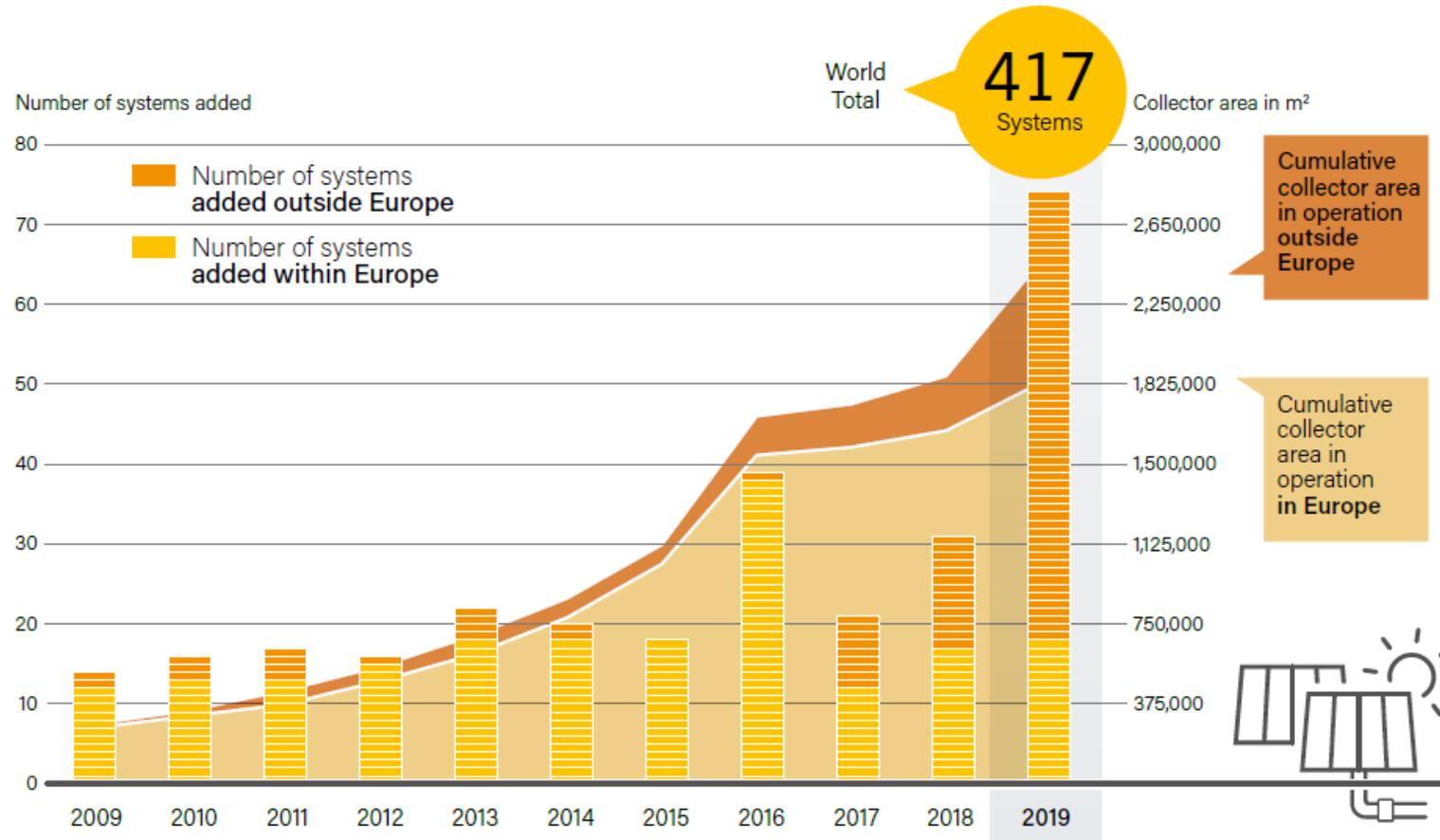


7 solar district heating plants with a total capacity of 26.6 MW, Germany, 2019



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Solar District Heating Systems, Global Annual Additions and Total Area in Operation, 2009-2019

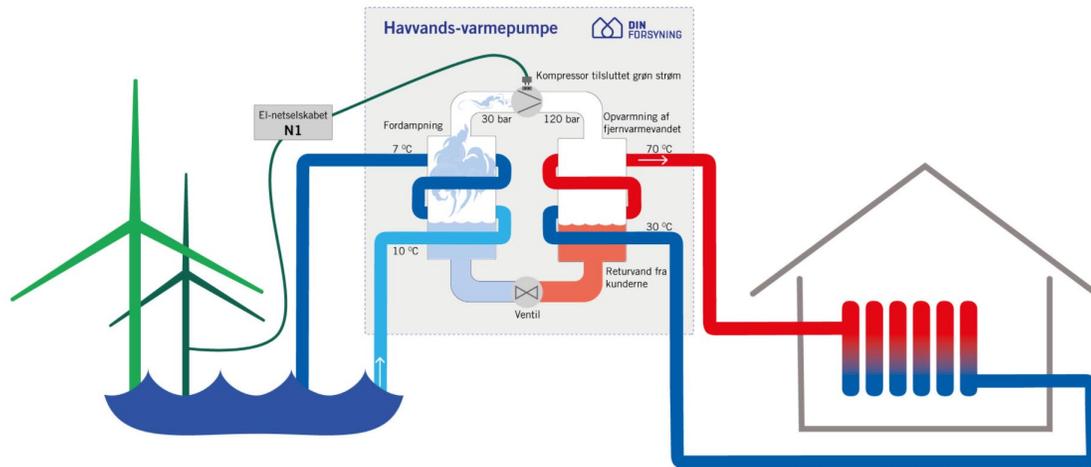


Source: REN21, Renewables 2020 – Global Status Report

INTERNATIONAL TRENDS – DISTRICT HEATING

- ❑ Heat pumps based on different heat sources – geothermal, waste heat, sewage, rivers/lakes/sea water etc.

District heating could cover up to 50% of the heating demand in Europe, and heat pumps could deliver around 25% of the energy transported by the district heating grid.



50 MW Sea water HP, Esbjerg, Denmark (under construction)

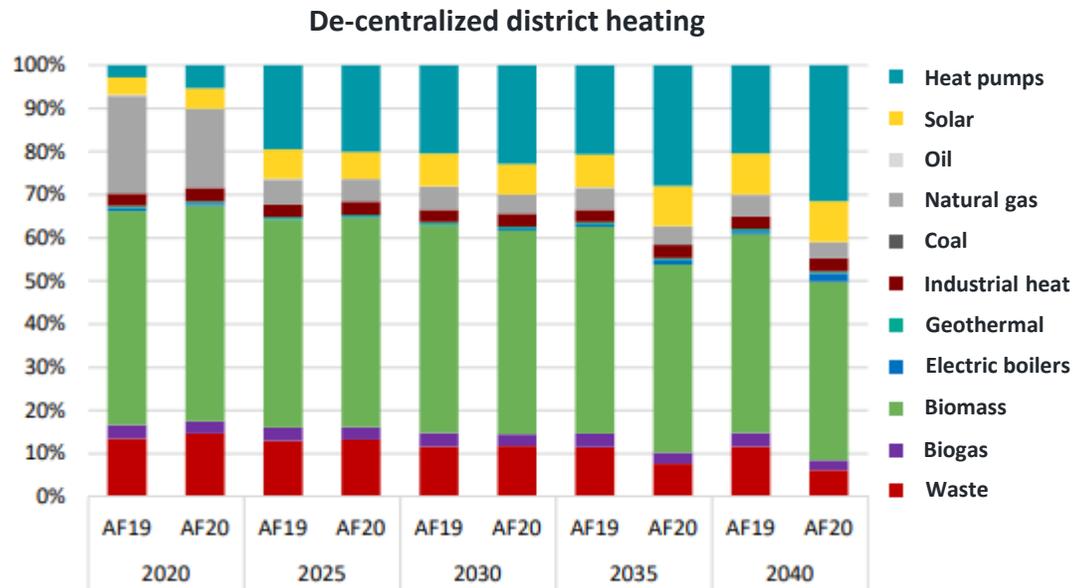


180 MW Sea water HP, Stockholm, Sweden

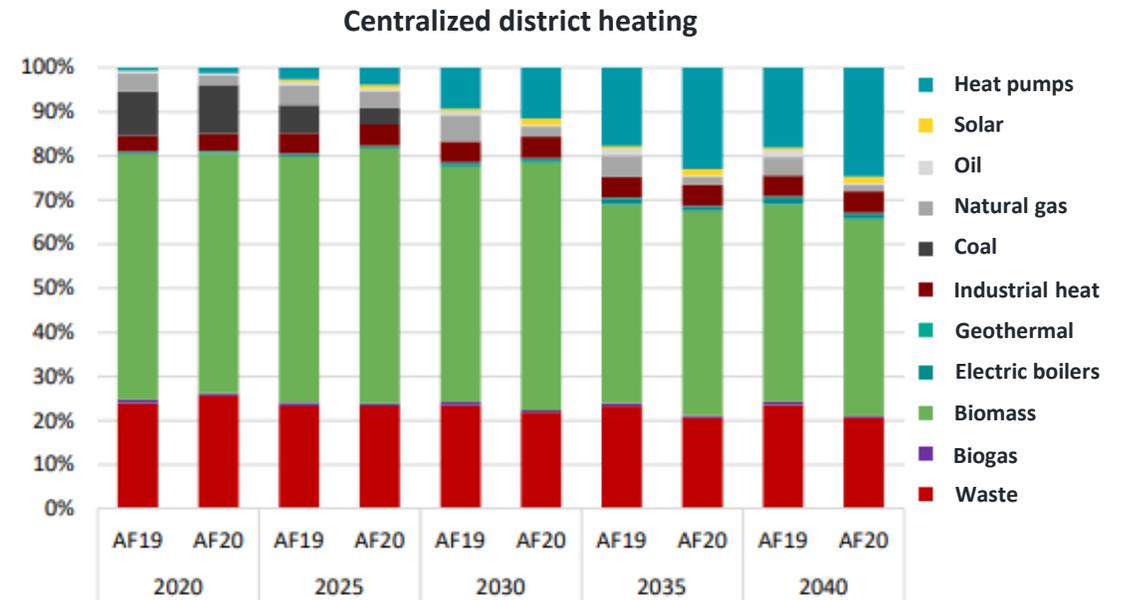
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INTERNATIONAL TRENDS – DISTRICT HEATING

ANALYSIS for DENMARK



AF19: Analysis for Energinet 2019

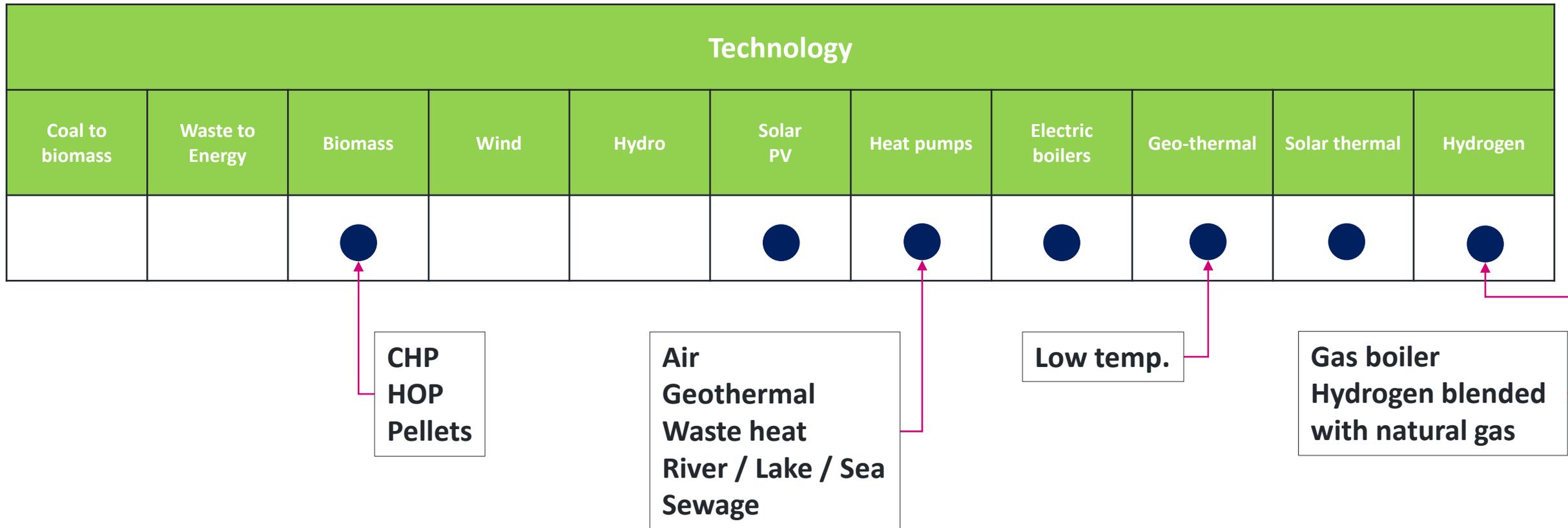


AF20: Analysis for Energinet 2020

Source: www.ens.dk

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TECHNOLOGIES - BUDGET ENTITIES / INSTITUTIONS / PUBLIC BUILDINGS



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BUDGET ENTITIES / INSTITUTIONS / PUBLIC BUILDINGS - TECHNOLOGY OPTIONS*

- Biomass boiler, automatic stoking;
- Biomass boiler, manual stoking;
- Wood stove;
- Electric heat pumps;
- Gas driven heat pumps; and
- Solar heating.

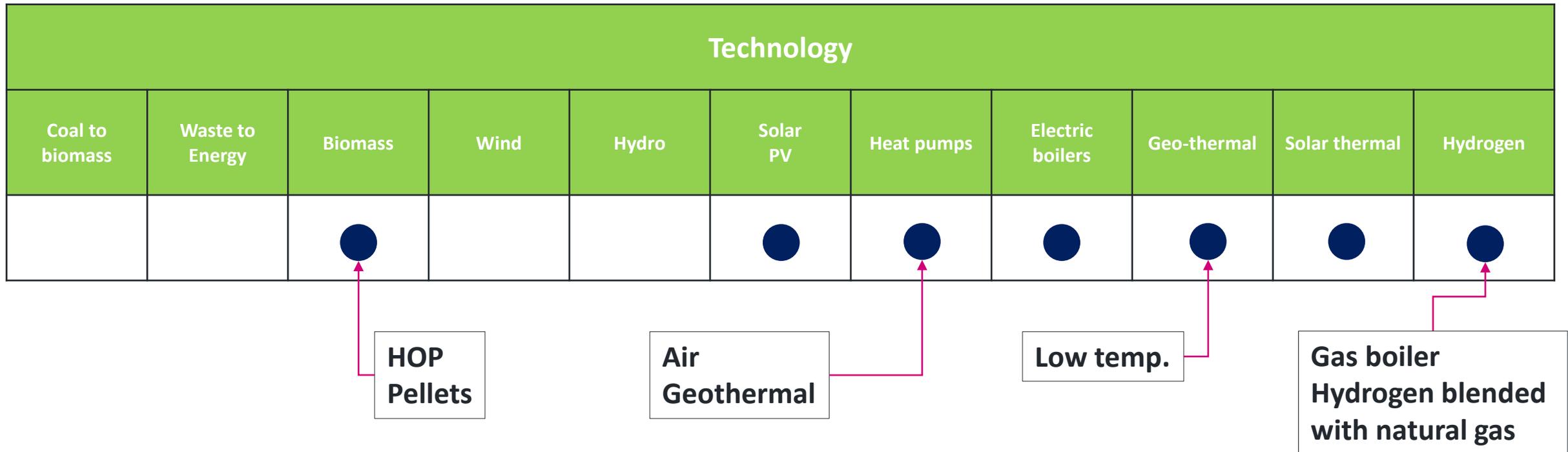
*Note: Please refer to the [Catalogue of Catalogue of Renewable Heat Supply Technologies](#) for more information

INTERNATIONAL TRENDS – BUDGET ENTITIES / INSTITUTIONS / PUBLIC BUILDINGS

- District heating
- Biomass boilers (wood pellets / chips)
- Heat pumps:
 - Air to Air;
 - Air to water;
 - Geothermal to water;
- Solar thermal
- Gas boilers (natural gas blended with hydrogen)

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TECHNOLOGIES - INDIVIDUAL HOUSES



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INDIVIDUAL HOUSES - TECHNOLOGY OPTIONS*

- **Biomass boiler, automatic stoking;**
- **Biomass boiler, manual stoking;**
- **Wood stove;**
- **Electric heat pumps;**
- **Gas driven heat pumps / boilers; and**
- **Solar heating.**

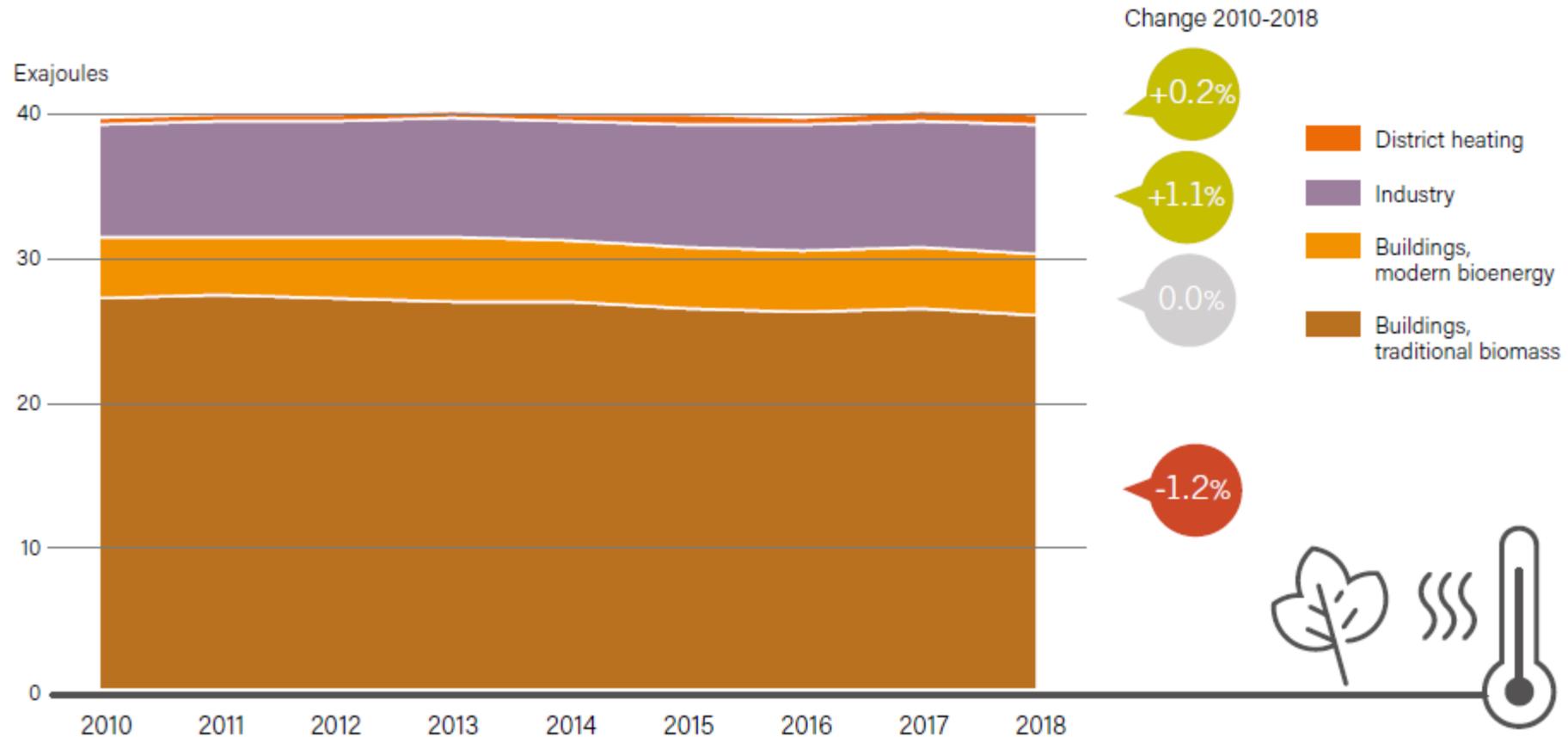
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INTERNATIONAL TRENDS – INDIVIDUAL HOUSES

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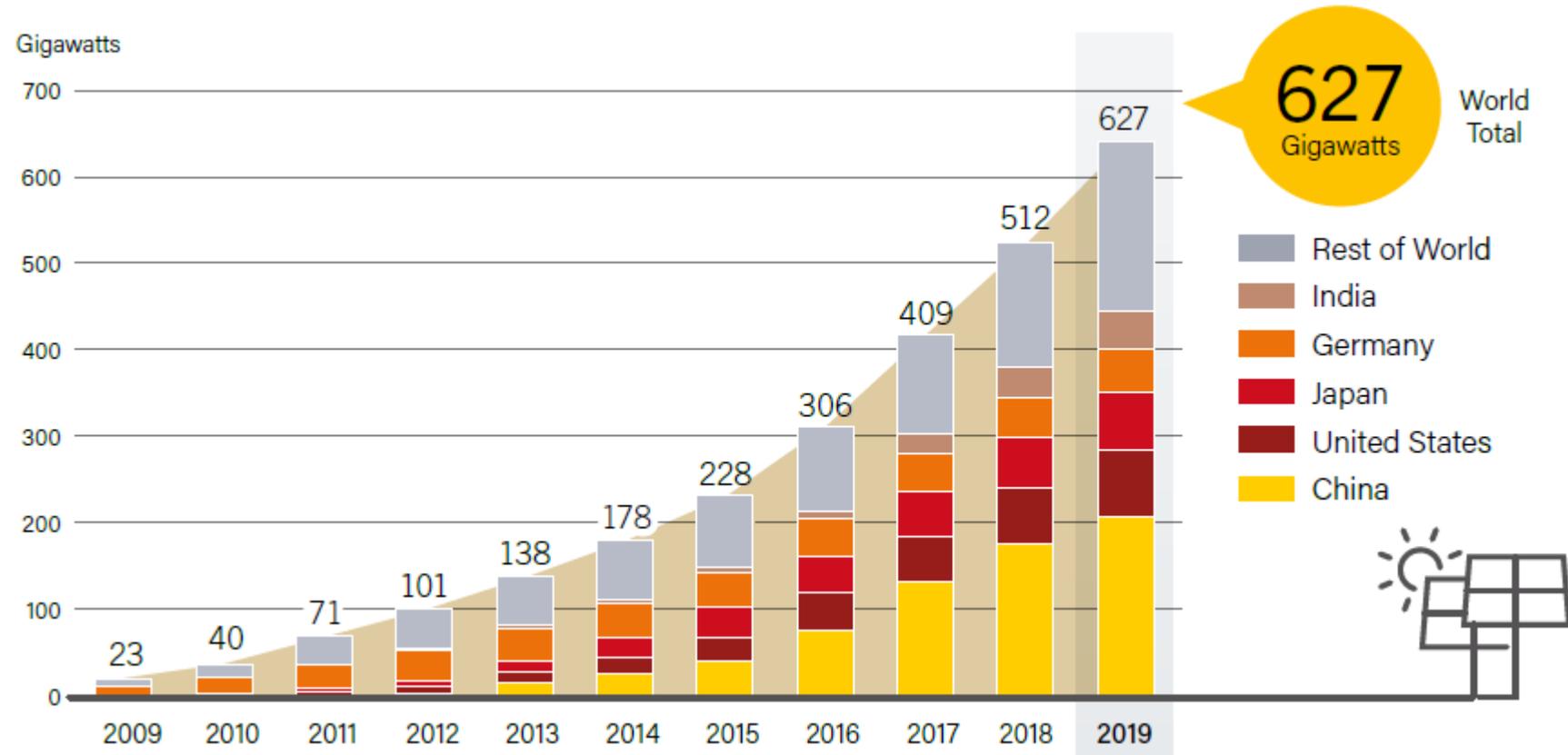
Global Bioenergy Use for Heating by End-Use, 2010-2018 – all sectors



Source: REN21, Renewables 2020 – Global Status Report

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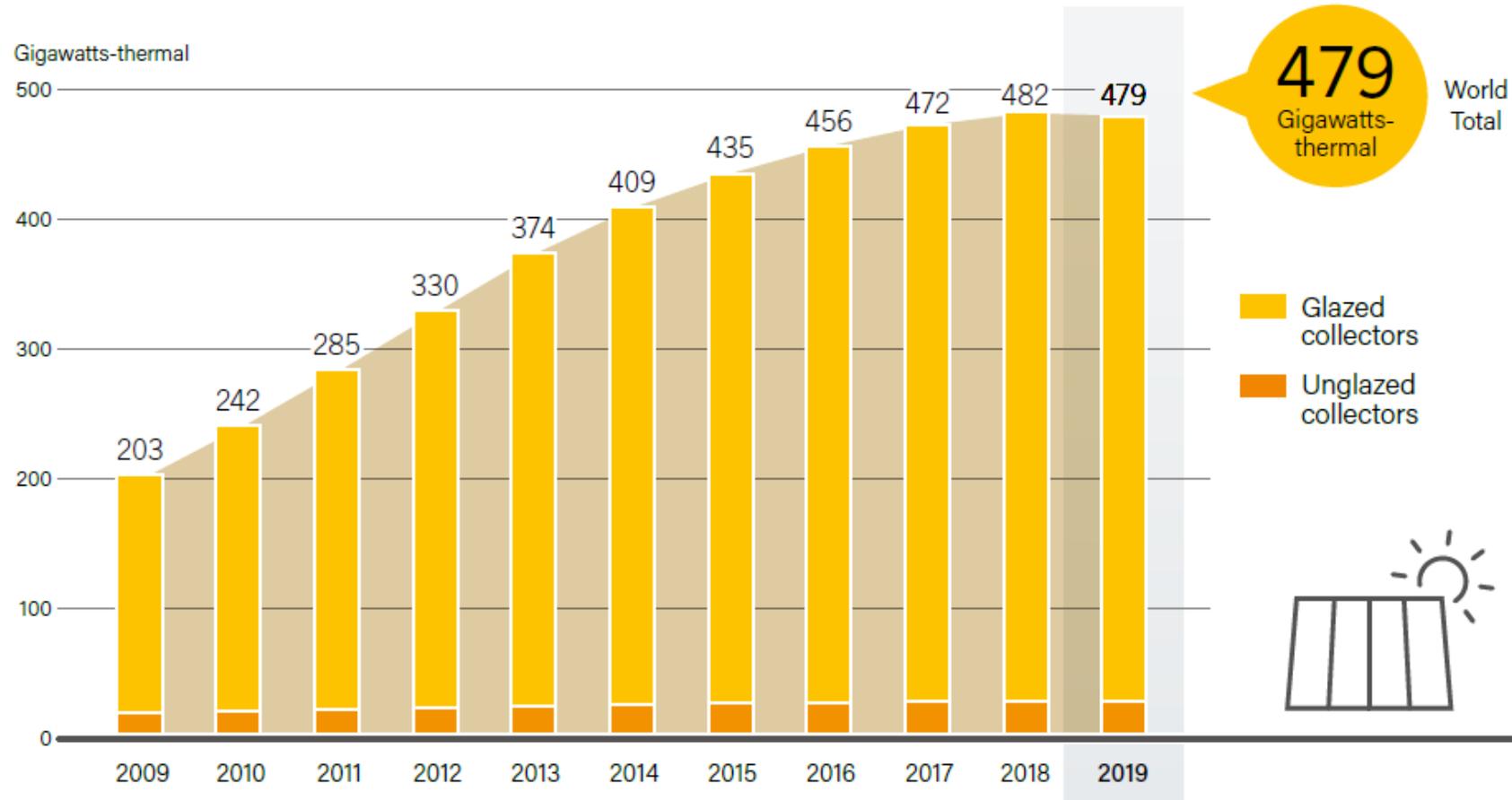
Solar PV Global Capacity, by Country and Region, 2009-2019



Source: REN21, Renewables 2020 – Global Status Report

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Solar Water Heating Collectors Global Capacity, 2009-2019



Source: REN21, Renewables 2020 – Global Status Report