

Renewable Energy Policies in a Time of Transition: Heating and Cooling

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20 May 2022

The energy for heating and cooling is largely sourced from fossil fuels



Share of energy sources in total final energy consumption of Total final energy consumption, by final energy use, 2018 heating and cooling, 2019 11.9% 5.2% Traditional use of biomass 0.3% Geothermal Non-renewable electricity Renewable .5% district heat 22% \Im Solar 0.7% thermal Electricity 10.4% Renewable 淤 electricity Heat Modern renewable energy 29% Transport 72.5% Fossil fuels and others Sustainable 6.9% bioenergy

Benefits of the energy transition in heating and cooling are clear



International Renewable Energy Agency







Barriers still exist on many fronts



Political and institutional barriers Lack of political commitment, including to universal access to energy • Weak institutional structures (heat markets are complex, fragmented and not well understood) • Inadequate data and statistics on types and amounts of energy required to meet heating and cooling needs Little awareness among decision makers of impact about the effects on the climate and the environment of using fossil fuels for heating and cooling Policy frameworks built around a fossil-fuel-based energy system Economic and financial barriers Playing field with fossil fuels is still not level, owing to: High upfront costs, including: Externalities not accounted for Capital costs · Persistent fossil fuel subsidies in many parts of the world Cost of and access to finance Unbalanced tax burden Other Weak supply chains, including: Consumer inertia and behaviour, Technical barriers, resulting from: including: • Infrastructure and renewable fuels • Lack of awareness about Building suitability potential and benefits • Shortages of trained personnel Industrial heat requirements • Distressed purchase and Reliability of technology Lack of economies of scale consumer inertia • Disruption and "hassle costs" Split incentives

Key indicators of performance related to renewable heating and cooling



The transition requires robust institutional coordination and a long- term integrated plan



Intersectoral coordination

Operating lifetime of heating and cooling infrastructure, systems and appliances





The five pathways and key infrastructure





Renewables-based electrification





Renewable gases



Biogas production by region and by feedstock and end use, 2017



Green hydrogen: The new wave of interest









Direct use of solar thermal heat



Solar thermal heat use by country, 2017 (PJ)

Global solar thermal capacity in operation, 2009-19 (GWth)





Direct use of geothermal heat



Geothermal heat use by sector and by country, 2017







Sustainable use of biomass



Bioenergy used for heating, 2018



Role of biomass for energy and feedstock by end-use sector in the energy transition



CHAPTER 06 SCALING UP SUSTAINABLE BIOENERGY

Bioenergy: policies need to ensure sustainability and minimise adverse outcomes





District heating and cooling as key enabling infrastructure









80% Renewable share in electricity

Provide universal access to clean, affordable and reliable heating energy



Ecosystem needs for livelihood-centric approach

Ensure a just and inclusive transition

Human resources required for the manufacturing and installation of SWHs for 10 000 single-family households, by occupation

The broad dimension of renewable energy policy making

