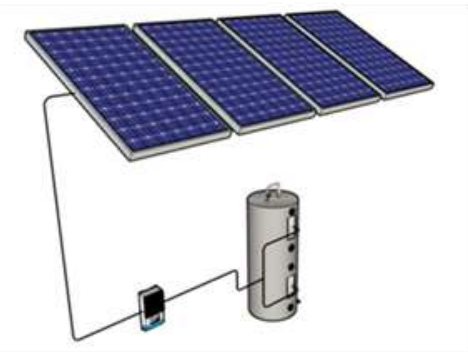
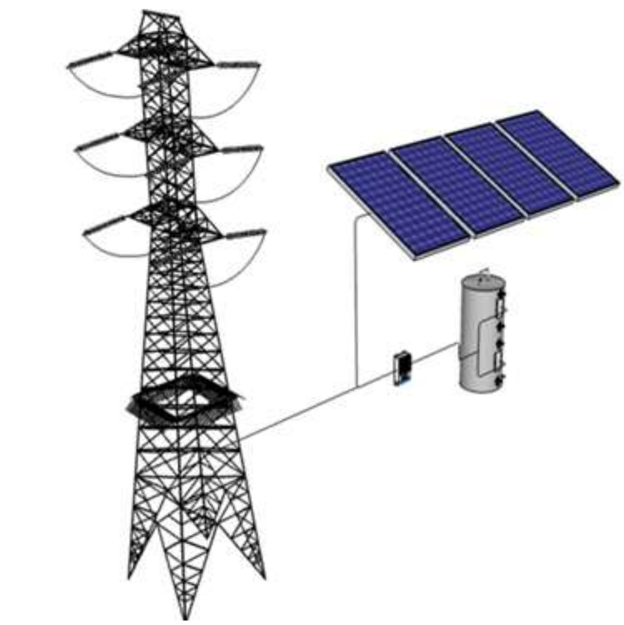
Policy Initiatives for Solar Photovoltaic Hot Water

Task 69 – Solar Hot Water for 2030

A Subtask C Report





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Policy Initiatives for Solar Photovoltaic Hot Water

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Solar Photovoltaic Hot Water: Policy initiatives for PV to Heat

Policy initiatives for PV to Heat

1. Introduction

Space and water heating consumes almost half of global energy use in buildings. Keeping homes warm in winter and providing hot water for sanitary needs represent essential energy services. Worldwide, around 40% of households require space heating during part of the year, with heating being a major component of home energy expenditure, especially in colder climates where nearly two thirds of heating energy still rely on fossil fuels (IEA, 2026).

While energy efficiency for building space heating has been steadily improving over the last decades, the energy needs to produce domestic hot water (DHW) has remained consistent. Consequently, the share of the energy for DHW in the total energy balance of buildings has **increased** in recent years and this trend will likely continue with space heating reductions and deployment of high efficiency lighting and appliances. Building legislation on efficiency of indoor space conditioning has become stricter while the energy demand for DHW has been somewhat overlooked. In addition to the continuous improvement of the building's envelope, populations have changed their practices and requirements regarding DHW.

About 15% to 20% of final energy use is dedicated to DHW in most houses and buildings worldwide. In the US, final energy use of hot water contributes about 18% (US Department of Energy, 2026), and in Europe about 14% on average, with different values depending on prevalent climate (Eurostat, 2026). Surveys on low energy buildings and recently built energy-efficient dwellings show that DHW production is already reaching 40% of the total energy usage (M.Z. Pomianowski, 2020).

These tendencies strongly indicate that improvement of the energy efficiency of DHW production and system operation is a crucial topic for new research and technology development, and they highlight the need for better understanding and overview of the current state-of-the-art (Pomianowski, Johra, Marszal-Pomianowska, & Zhang, 2020).

Figure 1 shows that in the Net Zero Scenario (NZE) of "*IEA Net Zero by 2050 - A Roadmap for the Global Energy Sector*" report (IEA, 2021) demand for space heating and cooling diminishes by 2030 and 2050, while DHW demand stays almost unchanged. This indicates that the need for hot water will stay as it is or even grow due to population growth, improved access to infrastructure and changes in consumer behaviour. At present trends DHW energy consumption is likely to be of the same magnitude as heating and cooling by 2050.

In the light of the above energy efficient and low carbon DHW systems will play an important role in the decarbonisation of building energy use.

Figure 3.28 ▷ Global final energy consumption by fuel and end-use application in buildings in the NZE

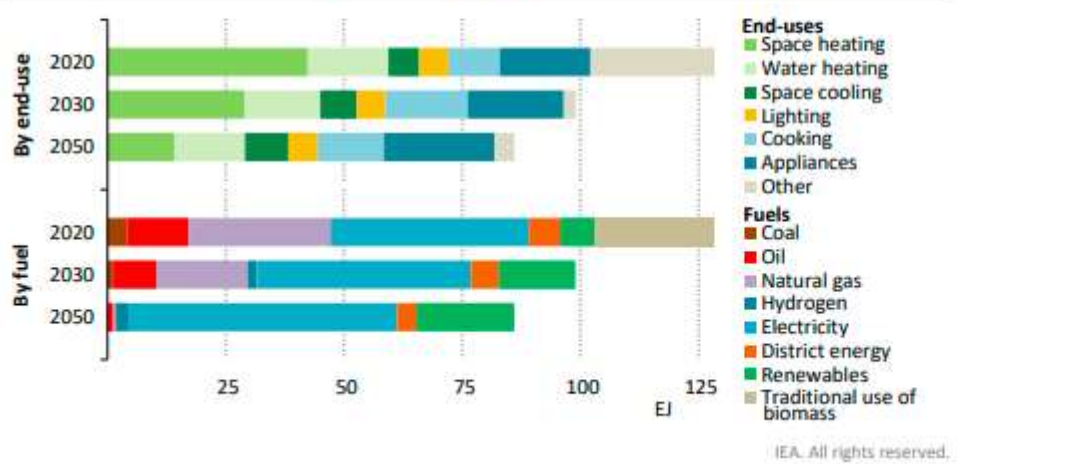

Figure 1. Energy demand for space heating, space cooling, and water heating for 2020, 2030, and 2050 (IEA, 2021, p143)

Despite the growing significance of DHW in total energy use, very few countries have adopted specific energy savings targets or decarbonisation strategies. Where they do exist, recommendations and policies for sustainable and efficient DHW heating are usually rolled in as just one of several measures incorporated in building regulations, rather than being a separate energy objective.

Until recently, the natural replacement for fossil fuels or electric water heaters in most countries has been solar thermal energy or high efficiency conventional water heaters, but as new technologies emerge and economies of scale help to lower costs, new market options are becoming available, such as air source heat pump water heaters and PV to hot water technologies (IEA-SHC, 2025a).

2. Hot Water Policy Status and Outlook

2.1 Current Hot Water Policies

To identify policy gaps for DHW solar heating technologies a specific policy analysis was undertaken through a combination of literature review and a survey of IEA experts. The literature drew on information from international organizations and scientific papers that identified specific policies for DHW applications.

As mentioned above, approximately 50% of energy demand is heat, which includes DHW, and the first step looked to see which countries have renewable heat demand targets. According to the last "*Renewable Global Status Report*" (REN 21, 2025) and as shown in **Figure 2**, only 35 countries have renewable energy targets regarding heat demand, while 143 have renewable energy targets in power demand as of December 2024. Renewable heat targets are exclusively found in Europe.

Renewable power or heat targets at a national level can have an impact on DHW energy usage, depending on the availability of resources and prevailing conventional water heating technologies. For example, Uruguay uses electric storage water heaters in more than 91% of water heaters. (Fundacion Bariloche, 2019), which raises the possibility that a power based renewable energy target could include a replacement of such equipment for more efficient alternatives. On the other hand, in countries were conventional water heating equipment based on fossil fuel combustion is prevalent, such as Argentina (More than 75% of water heaters are Natural gas based) (Iannelli, Prieto, & Gil, 2016), an electrical power based renewable energy target is unlikely to have any impact on domestic water heating. In such cases, a heat-based policy could be more influential.

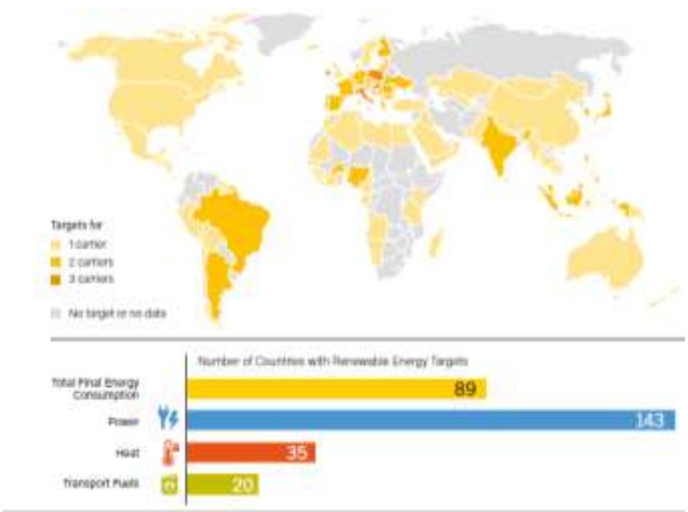

Figure 2. Countries with renewable energy heat, electricity, and fuel targets for 2024. (REN 21, 2025)

Given the context-specific and decentralized nature of heating and cooling needs, specifically regarding domestic hot water, local governments can play a key role in scaling up the use of renewable hot water heating options and defining specific policies. Within countries, specific local policies may apply at a provincial or municipal level while not nationwide. The provision of a national target is always a good start, but not completely necessary. One example is that of the first solar thermal ordinances in the city of Barcelona which fostered their take-up in other cities of Spain, but not nationwide (Puig, 2008). Similar situations occurred within Mexico City and Rio de Janeiro (IRENA, 2020).

In the cases above the policies were technology specific, where the use of solar thermal was mandated by the solar ordinance itself. Other policies are not so prescriptive of a specific technology but rather aim at a total energy consumption saving, which is more usually the case for most countries in the European union. There are also widespread differences among policies regarding mandatory or voluntary technology implementation.

To assess the situation regarding solar water heating, a survey was performed among the IEA-SHC experts. The full survey can be seen in ANNEX I. The origin and number of answers can be seen in **Figure 3**.

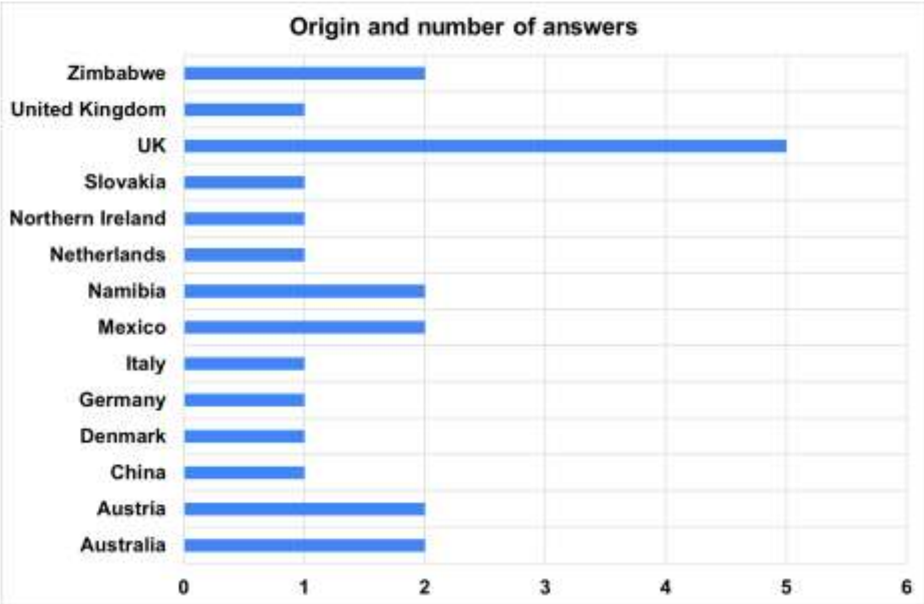

Figure 3. Origin and number of answers of the survey disseminated amongst IEA-SHC experts.

Figure 4 shows some of the results of the survey regarding policies for hot water. Not all participating countries have policies regarding the use of renewable energy for sanitary hot water heating, which is aligned with the fact that most countries do not have a target for renewable heat energy.

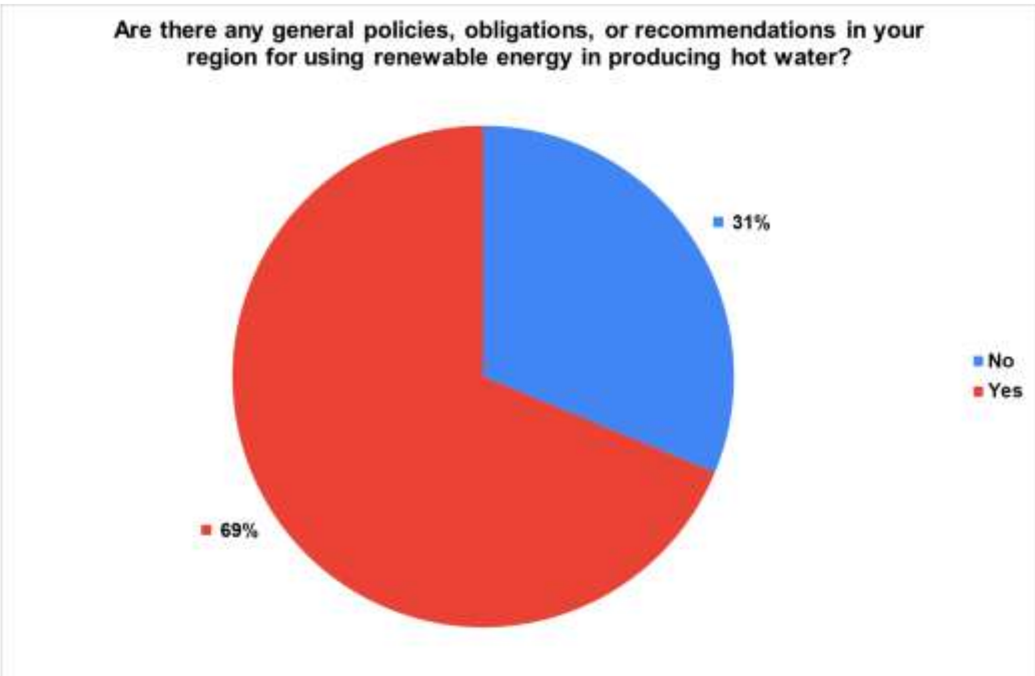

Figure 4. Results for the survey question regarding existence of policies for hot water.

Among those that did not have a policy or recommendation, it was asked if they thought if there is a need to include PV hot water, heat pumps, and other options of renewable energy use in hot water policies. **Figure 5** shows that most of those without a policy or recommendation for hot water (80%) agreed that there was a need while others (20%) did not identify that need.

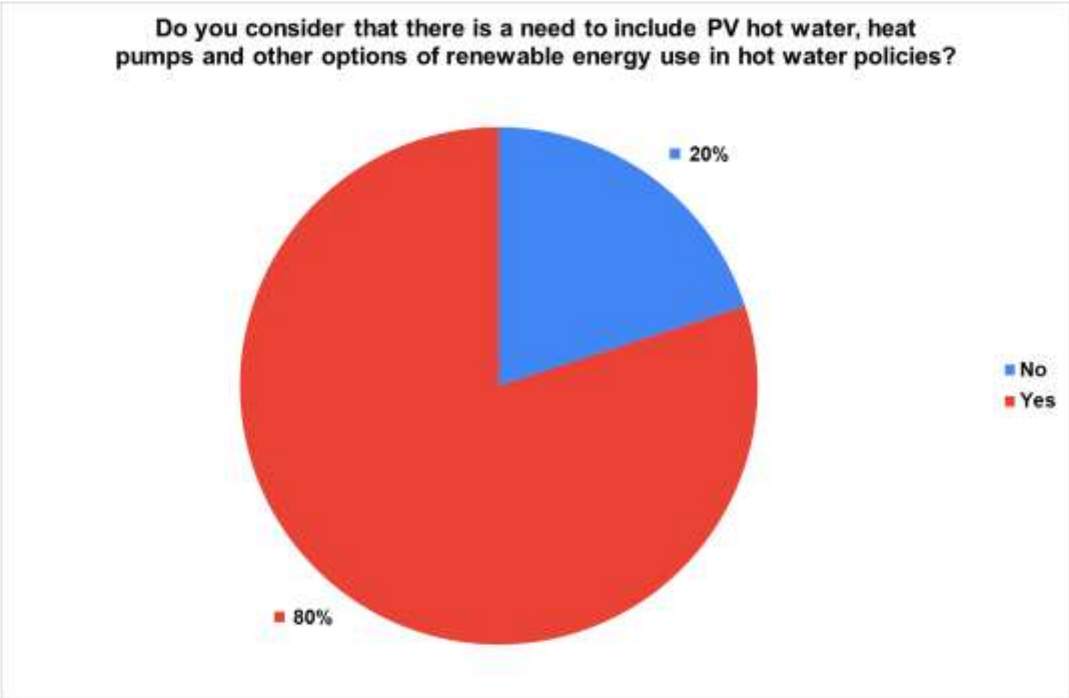

Figure 5. Results for the survey question regarding the need to include all technologies in a policy.

On the other hand, **Figure 6** shows that in **the case of those who do have a policy and or regulation for hot water, 83% are not related to any specific technology, leaving only 17% which are related specifically to solar thermal**. For those related to solar thermal, some are related to a specific amount of hot water and others to a threshold of energy savings. In those where technology is non-specific, all regulations are related to some amount of energy use, either maximum energy consumption or a minimum energy saving, and there are also some cases defined by CO_2 emission savings. **Table 1** shows the countries where a policy was identified with a brief description of the requirements. **Figure 7** shows the requirement of the policy: a percentage of total energy consumption, an amount of renewable energy, litres of hot water from renewable energy or emission savings.

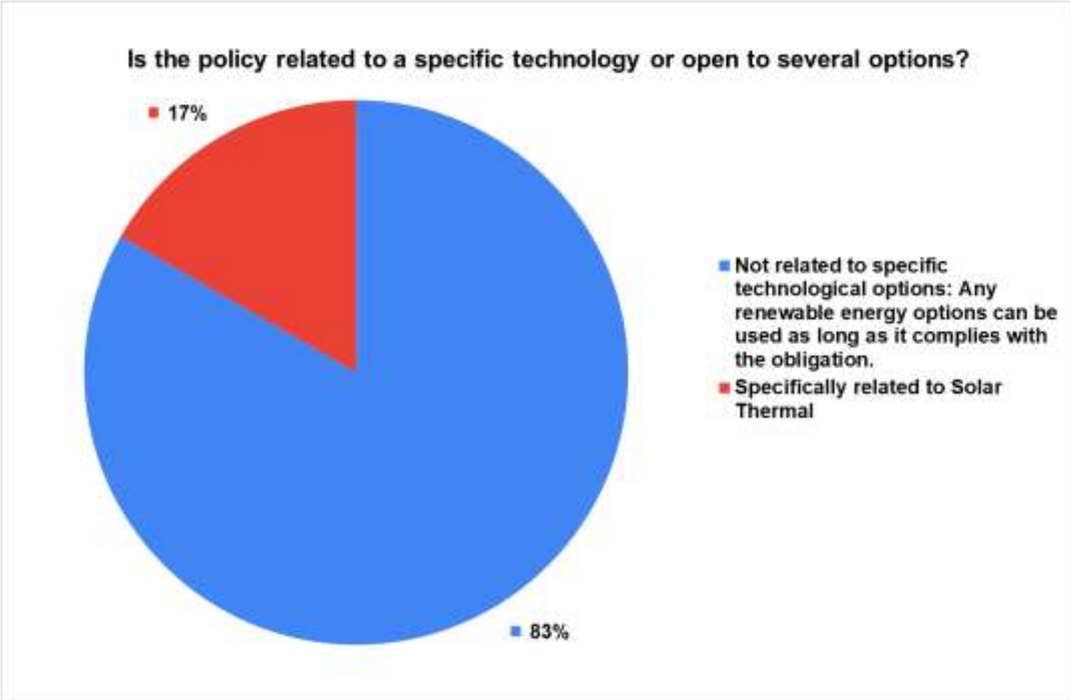

Figure 6. Results for the survey question regarding the relation of the existing policy to specific technology.

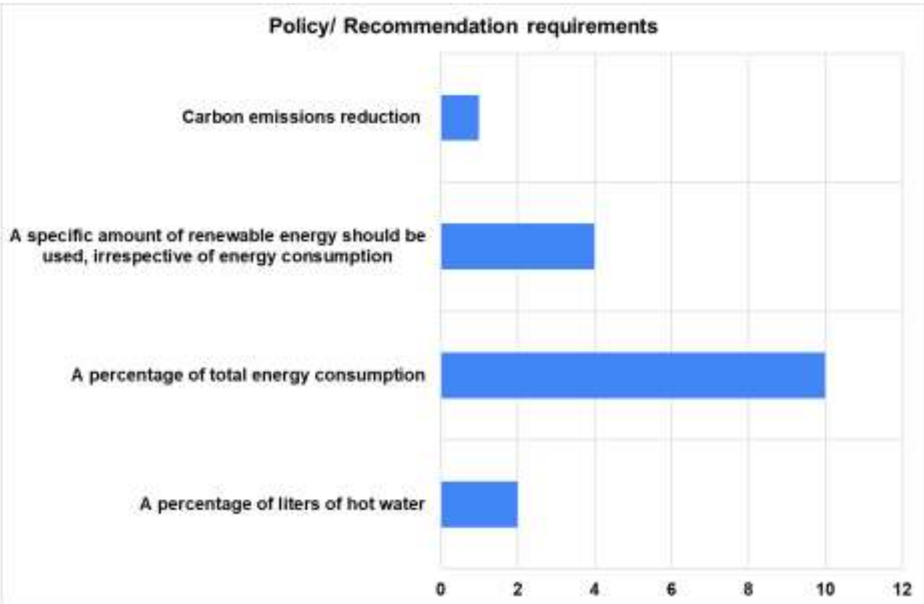

Figure 7. Basis of requirements for each for those countries that answered having a policy.

Country	Policy, obligation, or recommendation establishes for the use renewable or conventional of hot water
Denmark	Energy efficiency requirements and building regulations
Slovakia	Act on Energy Efficiency of Buildings and related decrees.
Zimbabwe	Renewable energy Policy for Zimbabwe,
Austria	Erneuerbare-Ausbaugesetz and Erneuerbare-Wärme-Gesetz (German version of EU Renewable Energy Directive (DIRECTIVE (EU) 2023/2413 OF THE EU)
Mexico	Mexico City mandatory installation of solar water heaters in new buildings
Australia	Small-scale technology certificates, establish minimum energy saving to obtain financial support.
Zimbabwe	SI235 of 2019 Water Heating. Establishes the obligation to use solar water heaters to save electricity at all residential levels.
UK	SAP10 (new build) and RdSAP 10 (retrofit) energy assessments reward use of PV Diverters for energy efficiency rating of the home and building.
Namibia	Cabinet directive: All public and parastatal to meet the hot water demand with solar water heating
Italy	D. Lgs 199/2021 - Art. 11 and Conto Termico
UK	Scottish Government New Build Heat Standard
China	General code for energy efficiency and renewable energy application in buildings
Germany	Building Energy Act (GEG) imposes obligations to use renewable energies for hot water production. From 2028, new heating systems must use at least 65% renewable energy.
Netherlands	There is a general requirement for new buildings to use a minimum amount of renewable energy. But this requirement is hardly enforced.
UK	Plymouth & SW Devon Joint Local Plan policy DEV32, supplemented the Climate Emergency Planning Statement.
Northern Ireland	Solar Thermal for hot water is grant aided for business premises in both Northern and Southern Ireland
Namibia	Cabinet directive of 2007 all public institutions and parastatals to meet hot water demand with Solar Water Heater
Australia	Disallowing the use of fossil fuel gas heaters for new housing developments

Table 1. Countries that answered positively to the existence of a policy for renewable energy in hot water and a brief description of it.

2.2 Policy Gaps

With the advancement in renewable energy technologies, new options have appeared such as PV hot water, heat pumps, hydrogen water heaters, biofuel water heaters, and others. The separation between heat and electricity has vanished and different combinations of solar thermal, PV panels, heat pumps and storage tanks are available in the market with different efficiency and prices. Except for a few cases, building codes and energy policies have not been updated to include these innovative technologies as valid energy saving or low carbon options. Figure 8 shows the results of the survey regarding the inclusion of PV2Heat systems. **This is an example of how these emerging technologies are not generally considered as an option**.

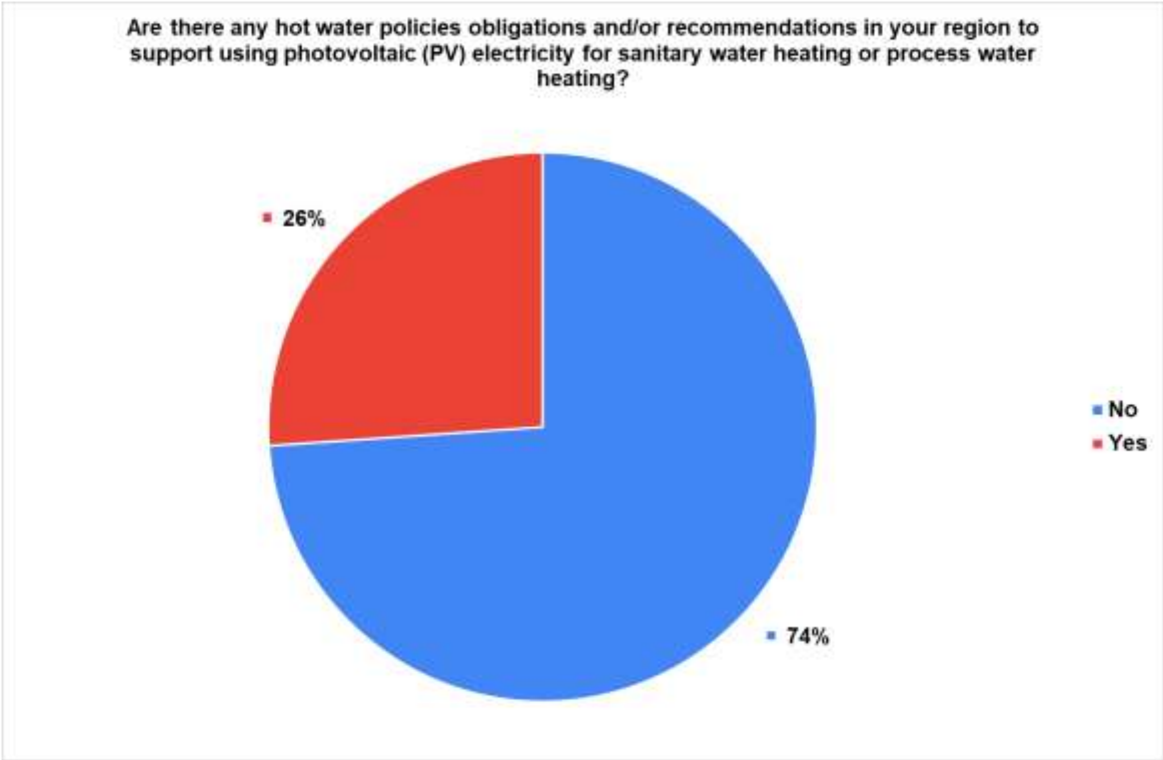

Figure 8. PV2Heat hot water policies.

New technologies will generally require additional quality and minimum efficiency specifications for their effective operation, such as minimum COP values for heat pumps, electrical certification for PV panels and safe combustion for biofuels and hydrogen.

Policies based on or aimed at energy or carbon savings, irrespective of technologies, are a better option for encouraging new and most appropriate technology adoptions, as contrasted with specific technology directives, such as solar thermal ordinances, will not necessarily encourage such performance improvements. However, multiple technology policies are more difficult to implement (from a government perspective) than are those designed for specific technologies (such as solar thermal). In an ideal case, a policy oriented towards renewable energy heat would allow all technological options to be included, allowing the market to adopt the most cost-effective solution. Complementary financial incentives, mandatory regulations, local climate and supply chain conditions will typically define the most appropriate or preferred technologies.

Regarding policies with financial support, the case is evenly split between those countries that do have some sort of financial support for the policy and those that do not, as shown in **Figure 9**. It is interesting to note that where there is financial support, there is no discrimination among technologies, such as loans only to be used for solar thermal systems.

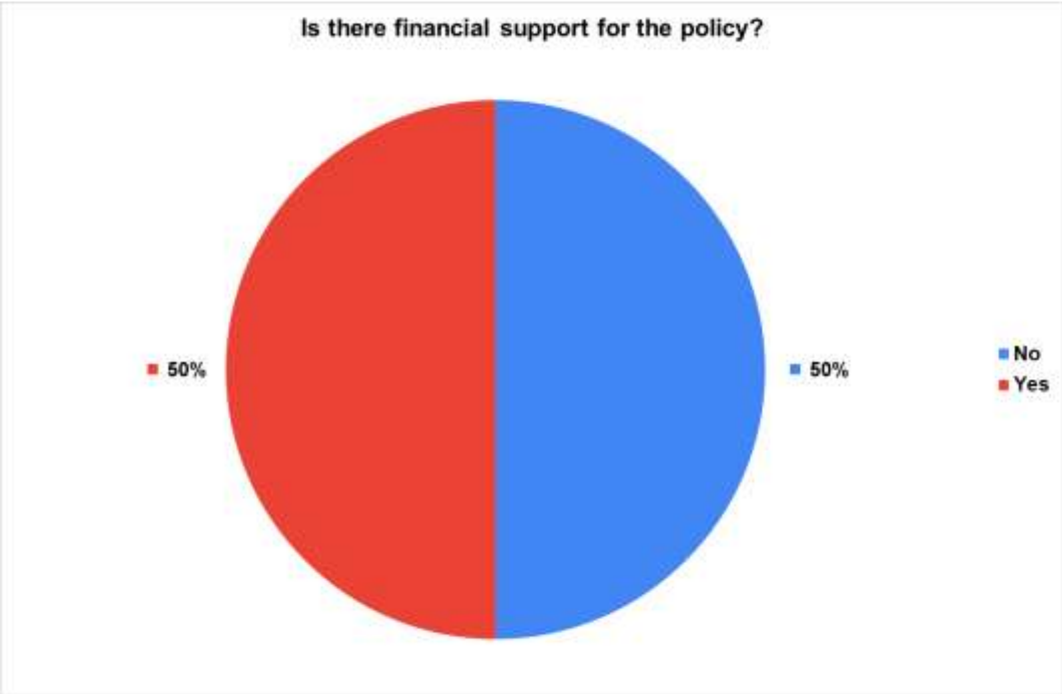

Figure 9. Financial support for the hot water policy.

2.3 Countries with updated hot water policies

This section presents some examples of regions and countries that have successfully incorporated solar PV-derived hot water into their policies in the last few years. These examples are used to identify possible best practice in development or adoption of specific policies that could accelerate the uptake for more efficient and low carbon DHW technologies, with a particular focus on PV to hot water technologies.

2.3.1 Australia

In Australia nearly 4 million solar PV systems have been installed under the Small-scale Renewable Energy Scheme (SRES) in Australia (Australian PV Institute, 2025), and rooftop solar PV generation provided over 12% of Australia's total electricity supply in 2024 (Clean Energy Council Australia, 2025). This raises the potential for Solar PV water heating to compete as an alternative to traditional solar thermal systems. In the middle of a sunny day, a rooftop system can generate more power than needed for typical household electrical loads. **When this happens, there is a choice between storage, export, or curtailment of the electricity**. Hot water tanks represent a low-cost energy storage option households, and utilizing excess electricity for hot water should provide more economic value than exporting it for low prices or curtailing production. Thus, although solar thermal systems are more efficient for direct water heating, PV hot water may provide excellent value to households due to their versatility and ease of integration with existing solar setups. **A key factor in the shift towards PV water heating is the significant decline in cost: it is less costly to install a single large rooftop PV system than a combined PV system with separate solar thermal water heater** (Clift, 2021). The most common water heater paired with a rooftop PV system in Australia is an air-source heat pump, but direct conversion of PV electricity to heat via a controller and electrical immersion element is gaining momentum for water heating (Clift, 2021).

Government policy has played a pivotal role in accelerating the adoption of solar PV water heating in Australia. Financial incentives have been provided to over four million households through Small-scale Technology Certificates (STCs), which reduce upfront costs for eligible solar water heaters and heat pumps. State-level initiatives, such as rebates and interest-free loans in Victoria and New South Wales, have further encouraged uptake. These policies have made solar technologies more accessible. As highlighted by the Climate Council (Clean Energy Council, 2024), policy measures—ranging from subsidies to feed-in tariffs—have significantly influenced the high rates of solar PV and solar hot water adoption across the country. Continued and expanded policy support is essential to ensure that solar PV production is fully utilised rather than curtailed, as it continues to reach higher levels of adoption during Australia's transition to a low-carbon energy future.

While the government also supports solar water heaters directly, the growing prevalence of PV + electric storage water heaters means more households are using PV electricity to heat water during the day. This is particularly effective when controlled load schedules are aligned with midday solar generation through dynamic load control mechanisms, including solar soak scheduling and Dynamic Operating Envelopes (DOEs).

An important regulatory framework that indirectly supports PV water heating is that the Australian state of Victoria, the Australian Capital Territory (ACT), and some NSW councils (e.g., the City of Sydney), that have introduced bans on gas connections for new residential developments. This policy was in part introduced to support net-zero emission goals and address health concerns linked to indoor pollution from gas appliances. The policy prevents builders installing gas cooktops and instantaneous gas water heaters, in place of induction cooktops and air-source heat pump water heaters. The policy also stops the installation of long-lasting and expensive gas pipeline infrastructure, which is likely to become a stranded asset.

These policies are not without their downsides. The rapid increase in both rooftop and large-scale grid connected solar PV has given rise to challenges for the wider electricity network. In some areas there is now substantial oversupply on days with high insolation and at times of low demand. This can lead to significant over-voltage events, with implications for system stability in the low-voltage networks. Rooftop PV and battery storage inverters are required to have voltage variation and power quality management control, which can lead to over-voltage tripping and extended periods of curtailment (Yildiz, et al., 2023). There is some disparity in the operation of these systems across the network, leading for calls to improve the reliability of service they can deliver, with some consumers experiencing higher curtailment rates than others. Current curtailment rates are low (1-2%) but are considered likely to grow. System voltage stabilisation can be achieved in other ways, including dynamic pricing to provide signals to consumers to increase demand. PV hot water diverters can provide this additional demand, with the advantage of using the storage to decouple supply with usage.

These periods of over-supply (high generation at times of low demand) are caused by the capacity of both rooftop and high upstream PV generation. The latter, in particular, helps to set the system marginal price which can go negative. Exposure to these negative prices by rooftop solar owners depends on whether they are on retail only contracts or are signed up to a Virtual Power Plant (VPP). VPPs provide large scale aggregation of small systems and operate in the wholesale market. VPP subscribers are exposed to price volatility, including negative prices where the consumer has to pay the aggregator to export excess electricity. There are attempts to mitigate this by shifting internal demand to divert excess self-generation (see, for example, https://help.amber.com.au/hc/en-us/articles/7415148284685-What-is-Amber-s-SmartShift-and-how-does-it-differ-from-a-VPP). Smart shift options only curtail export and not the whole PV output, maintaining the value of solar rooftop systems in peak output periods, and is a mechanism that could see a larger market for PV hot water diverters. This solution does raise issues around local solar sharing options where rooftop owners export to their neighbours at peak times, thus potentially decreasing storage capacity when export is curtailed.

Another development is the solar sharer offer due to take effect in July 2026[1]. This is a scheme offered by the Australian Federal Government to encourage households to shift their appliance use during the solar generation period. This scheme is proposing to provide at least 3 hours per day of free electricity during the peak solar generation period. Households need to have a smart meter, but they don't need to have a solar or battery system. So practically, regardless of solar, battery, controlled load or advanced water heating control ownership, households will be able to heat their water freely via resistive systems or heat-pumps. A simple timer set up may be sufficient for that 3-hour window, a low-cost solution that takes advantage to effectively free excess solar electricity.

2.3.2 South Africa

South Africa has a widespread use of electric storage water heaters. To help address power grid capacity issues within the country regulation SANS10400 XA defines energy thresholds in new buildings and residences and/or additions. Regarding hot water, it establishes "– *not more than 50% of the annual volume of domestic hot water*

[1] https://www.energy.gov.au/news/solar-sharer-offer-cut-electricity-bills

should be supplied by means of electrical resistance heating, i.e. 50% or more of hot water used must be heated by energy sources other than electricity…". This and other complementary regulation allowed an annual installed solar thermal collector area in South Africa fluctuating around 150,000 m² per year without showing a clear upward trend (Solarthermalworld, 2025). The preferred technology to comply with SANS10400 XA is usually a heat pump, but this requires power from the grid and, ultimately, from grid tied PV systems. The subsequent increase in power shortages in South Africa paved the way for PV2heat technologies to get established. These systems do not need electricity from the grid since they can use DC electricity directly from rooftop PV panels. Given the ease of installation and lowering cost of these technologies, installation rates of PV2Heat systems are growing faster than solar thermal systems.

This is an example where technological evolution overtook the intent set out in the regulation's guidance (NEDBANK, 2014). At the time of issuance, heat pumps and solar thermal were included as only options to comply with SANS10400 XA, although other technology options were not actually excluded. Since then, PV2Heat systems have become widely adopted in the country even though not specifically mentioned in the original regulation.

The annual report Solar Heat Worldwide (IEA-SHC, 2025b) published the clear growth path of this segment (see **Figure 10**). The market volume quadrupled from 2,418 systems sold in 2018 to 9,952 systems in 2023.

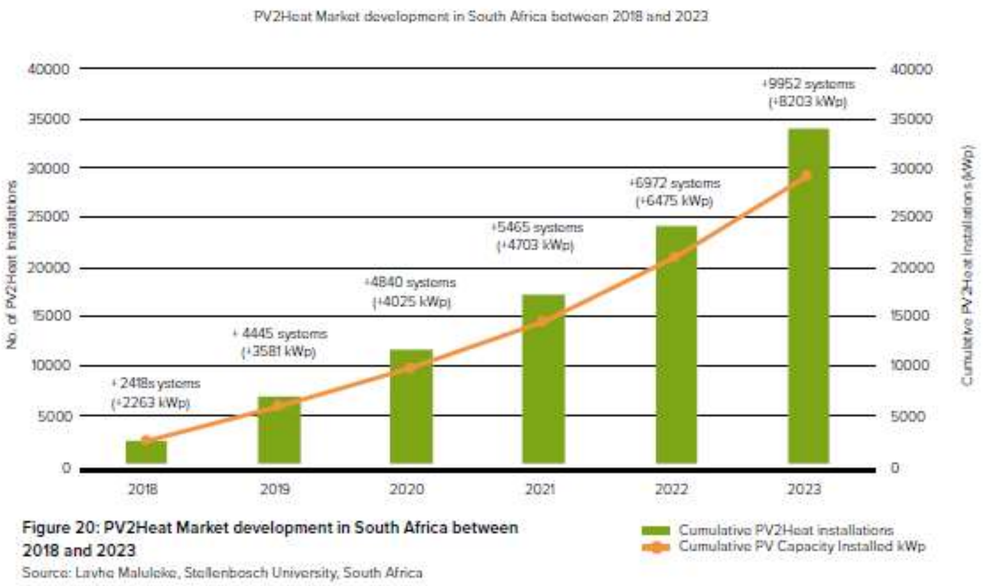

Figure 10. Growth of PV2Heat market in South Africa

2.3.4 UK

The Future Building Standard establishes that to decarbonise new domestic buildings, all heat and hot water needs should be met through low-carbon sources (UK Government, 2026). Buildings constructed to the Future Buildings Standard will need to use low-carbon heating and hot water systems to meet the carbon and primary energy targets in almost all circumstances. The UK has policies to promote the integration of PV (photovoltaic) and low-carbon heating, such as heat pumps, through the Future Homes Standard, which mandates solar PV and heat pumps in new-build homes starting in 2027. While the policy is being implemented under a Labour government, the Future Homes Standard originated in 2019 and has seen support from across the political spectrum. The original timeline, proposed under the Conservative government, included a 2025 gas boiler ban, although this has subsequently been delayed. The updated timeline puts full implementation in 2027, offering a clearer framework for housebuilders and consumers alike.

PV systems have benefited strongly from the decrease in installation costs, even though government support mechanisms, such as the Feed-in-Tarriff, have been withdrawn. Solar thermal systems have not seen any significant market share in the UK, and yet over 1.6 million residential PV systems (almost 6.4 GW) had been installed by the end of 2025 (UK Accredited Official Statistics, 2026). PV is considered a much more valuable use of rooftop space than solar thermal, which in turn suggests PV hot water technologies could play an increasing role in residential energy decarbonisation. As electrification of heat becomes more widespread PV hot water solutions can be employed as a complement to heat pump space heating and hot water.

Solar PV is set to grow through both domestic and grid level generation, with a target of 45 GW by 2030 (UK Government, 2024), in which case the UK might do well to look to Australia for ways in which to manage grid congestion and curtailment risks. The Energy Systems Catapult makes the case that smart thermal storage will be an option for delivering essential demand flexibility services in a decarbonised electricity grid (Energy Systems Catapult, 2026). It estimates that smart thermal storage could deliver 200 GWh per year of flexibility, with 150 GWh in commercial buildings. This further extends the market envelope for PV to hot water storage technologies.

3. Conclusions and Recommendations

There are very few examples around the world of energy policies specifically geared towards low carbon or renewably generated hot water. Solar ordinances range from requiring permits to install solar technologies on buildings (for example permitted developments in the UK) to mandating solar thermal contributions towards DHW, as pioneered in Spain (I found this document which could be added to the references http://www.estif.org/policies/solar_ordinances/). Most policies on building energy use are holistic, in that they combine space heating and DHW into overall energy or carbon emissions avoidance targets, and where space heating may involve specific measures, DHW often carries no regulatory requirement. Where solar thermal is mandated, this is more usually at the local and regional level and is more likely to occur in high solar incidence climate zones.

However, where DHW policies exist, they do not explicitly include opportunities for the use of PV to hot water technologies, but there are emerging policies and mechanisms whereby they may be encouraged or even required. For example, the UK Future Homes Standard carbon targets will require the decarbonisation of DHW within the whole building targets, meaning low or zero carbon options will be necessary. Australia has seen a growth of PV to hot water through a mix of financial support mechanisms and regulations, and South Africa also has emerging regulation that recognises the advantages that PV to hot water adoption can provide.

These advantages can be very specific to either local climate and/or market conditions, or availability of technologies. Two primary drivers for PV hot water technologies are the reduction in cost of PV systems and general decarbonisation policies. While solar thermal offers greater efficiencies, PV installations can supply multiple end uses while avoiding high price grid electricity. Alternatively, in unstable or off-grid regions, PV now offers lower cost DHW provision than solar thermal. Taken together these two types of market offer significant growth opportunities for PV to hot water that should gain greater recognition from the policy makers.

Given the competing interests between solar thermal and PV for thermal applications any policy on DHW energy or carbon avoidance should be technology neutral, with local conditions and considerations providing the incentives for specific technology adoption. In less resilient electricity grid regions this may be an issue of capital cost or technology supply chains, but where electricity networks are more mature, and especially where they are undergoing a low carbon transition, there are a number of additional considerations.

Countries with strong rooftop PV growth often also have policies for larger scale solar PV deployment, whether connected at the distribution or transmission system levels. Such countries include many European countries, the UK and Australia. Whereas the rooftop markets were often kick-started via feed-in-tariffs, current market growth is due to other policies or cost reductions. Many domestic systems are coupled with battery energy storage to increase utilisation and avoid high electricity prices. Domestic PV export is no longer encouraged and may be actively discouraged in some jurisdictions. This can be due to the growth in grid connected PV, where there arises a conflict of interest between bulk energy suppliers and individual demand reduction: the domestic rooftop systems reduce the demand on the grid for the large-scale suppliers, while domestic export is in direct competition with the larger generators. Grid security and stability concerns generally tilt these system operation concerns in favour of the large-scale producers. In parts of Australia, for example, solar electricity generation can reach saturation and lead to curtailment of generation, and domestic rooftop systems are required to be fitted with disabling capability in the event of power quality variations. This not only prevents export, but eliminates the PV output, thus maintaining the demand availability for the upstream generators. This imbalance of market actors can disadvantage the end user, who also has an investment to recover. This raises important ethical, financial and technical issues that policy makers need to be aware of as grid scale solar PV systems become more widely deployed. Policy that is designed to increase solar adoption at a regional and national level, that encourages both end user (individual rooftop) and grid scale deployment, should treat the end user as an equal actor in the market and system operation. The Australian example suggests that the use Virtual Power Plants or smart load shifting can provide load balancing and increased solar utilisation that can benefit the end consumer by delivering enhanced, low cost, demand flexibility options that include PV hot water technologies.

This principle can be adopted in different applications and configurations, for example where micro-grids are adopted. Micro-grids, or community connected electricity networks (with local PV) can provide local energy supply optimisation, together with grid balancing services and energy demand reduction mechanisms. PV to hot water technologies can be part of the optimisation solution and can be complementary with, or alternative to, battery energy storage. Policies that encourage such network solutions should be explicit about the load management opportunities, and this can include PV to hot water.

In summary, there are significant opportunities for PV to hot water to deliver improved services, reduce costs and carbon emissions and assist with electricity network stability, security and actor participation. However, there is a lack of standardisation around system sizing and operational calculation methodologies that would support any policies designed to encourage or mandate the uptake of renewably generated DHW using PV systems.

The above considerations lead to the following recommendations around specific PV to hot water policy development:

- PV to hot water technologies should be specifically identified as a technology option along with the merits and potential applications.
- Policies that support renewably derived DHW should be technology neutral and should be designed to enable rather than mandate.
- Where domestic PV is deemed to provide grid, stability risk any curtailment should be confined to export reduction, rather than disabling the inverter output. Domestic investors should be allowed to use excess generation in the most cost optimal way.
- Electricity tariff or carbon price signals can be designed to maximise solar PV utilisation. This might apply to allowing grid level oversupply to be diverted to domestic hot water storage, as well as encouraging end user load shifting.
- Standardised energy and carbon calculations for PV to hot water systems, along with safety and installation practices, should be developed to enable better policy clarity and adoption.

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