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Integrating Solar and Heat Pumps in New Builds: A Guide for Housebuilders

Two systems, one electricity bill.

SCOTT WHITESIDE / 30 JULY 2025

Gas boilers are being gradually phased out across the UK housing market, and from March 2027 the Future Homes Standard will require all new homes to operate with low-carbon heating systems.

As air source heat pumps (ASHPs) become the standard for new homes, they bring a host of benefits but also new design and cost considerations. These include higher electricity demand, greater exposure to electricity price volatility, and the need to carefully manage SAP and EPC performance.

Integrating solar PV with ASHP systems in new homes offers one of the most effective ways to mitigate these issues. By generating renewable electricity onsite, solar panels can offset heat pump demand, reduce running costs, and improve energy performance ratings.

This guide explains how solar and heat pumps work together in new build homes, how the combination affects energy costs, and why design-stage integration is critical for housebuilders.

The Electrical Impact of Heat Pumps

Air source heat pumps are significantly more efficient than traditional gas boilers. In many cases they deliver three to four units of heat for every unit of electricity consumed. However, they also represent a major shift in a home's energy profile – from gas to electricity – which has cost and design implications.

For a typical three-bedroom new-build home, installing an ASHP may increase electricity consumption by 3,500 to 4,500 kWh per year for heating alone. This raises total electricity demand substantially and leaves homeowners more exposed to fluctuations in electricity prices. Electricity currently costs around four times as much as gas per kWh, meaning heating bills for all-electric homes without onsite generation can quickly exceed those of gas-heated properties.

Another key factor is how heat pumps operate compared with traditional heating systems. Gas boilers typically deliver short bursts of high-temperature heat, switching on and off throughout the day.

Heat pumps work differently. They perform best when running continuously at lower temperatures, maintaining a steady indoor climate. This creates a flatter but higher base electricity demand, especially during evening and overnight hours. Because solar panels only generate electricity during the day, homes without storage must rely on the grid for this additional demand.

Adding battery storage for solar and heat pump systems in new builds allows excess solar energy generated during the day to be stored and used overnight, reducing reliance on imported electricity.

Real-World Scenario: Heat Pump With and Without Solar

To illustrate how different energy and heating systems affect running costs, let's take a typical three-bedroom, semi-detached home in the UK as an example:

Estimated Annual Energy Costs for a Three-Bedroom Home

SYSTEM TYPE	ANNUAL ENERGY COST (HEATING & HOT WATER ONLY)	KEY ASSUMPTIONS
Gas Boiler Only (No Solar)	£1,200	Assumes energy demand of ~12,000 kWh gas/year
ASHP Only (No Solar)	£1,350	~4,500 kWh added to standard energy demand
ASHP + 5.5kW Solar	£950	Rooftop solar yield offsets ~20–40% of demand
ASHP + Gryd Smart Solar System (inc Battery Storage & Optimisation)	£800	Smart ongoing optimisation of solar and ASHP load. Including a battery increases the usable generation to ~70%+

A 5.5kW solar system (producing ~4,500–5,000 kWh/year) can cover a substantial portion of both heating and general household electricity needs, particularly when paired with controls and battery storage.

Figures are based on 2025 average unit prices (electricity @ £0.30/kWh, gas @ £0.10/kWh).

Meeting SAP and EPC Targets With Solar and Heat Pumps

For housebuilders delivering the next generation of low-carbon housing, combining solar PV with air source heat pumps is one of the clearest paths to meeting the forthcoming Future Homes Standard requirements.

Under SAP 10.2 – and with further updates expected under SAP 11 – renewable electricity generation significantly improves energy modelling outcomes.

Key benefits include:

- Lower primary energy and emissions factors when solar is used on-site
- Improved Dwelling Emission Rate (DER) performance
- Easier compliance with Part L and Future Homes Standard thresholds

This means homes using solar PV and heat pumps together often perform better than gas-heated homes when it comes to meeting Part L requirements and Future Homes Standard targets.

For developers, this combination provides a practical pathway to achieving stronger SAP scores and EPC banding.

Supporting Solar Integration for New Developments

For developers integrating solar PV with heat pump systems, careful system sizing and energy modelling are essential. Design-stage planning is critical, enabling correct sizing of heat pump systems, optimal solar orientation, and the seamless integration of energy storage or smart load-shifting technologies. These early decisions can significantly influence SAP scores, EPC ratings, and long-term energy costs.

For developers looking to integrate solar effectively alongside heat pump systems, Gryd can advise on system sizing, generation modelling, and smart energy controls that supports the broader energy strategy of each home and improves SAP scores.

While we don't specify or install heat pumps directly, we work closely with housebuilders to ensure our solar systems are deployed in a way that complements the electric heating and smart energy management in new builds.

If you're exploring solar integration alongside heat pump systems, get in touch with Gryd to discuss how our smart solar solutions can support your next development.

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> https://gryd.energy/hub-directions/g/articles/integrating-solar-and-heat-pumps.html
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