



Sark Community Power

5.30pm on 25th March - Island Hall meeting for residents to present conclusions of design stage works and next steps for Sark Community Power

The next Island Hall meeting for residents on the future of Sark's community owned power system will be held at 5.30pm on 25th March. The meeting is open to all Sark residents and will cover:

- 1) Plans for Sark to take ownership of the existing infrastructure and carry out remedial works to make it safe**
- 2) Outcomes of the design stage work for a partial or full replacement of Sark's power system**
- 3) Next steps for Sark Community Power and how the power system would be operated once brought into Island ownership**

Speakers will include: John Guille (Chairman, Policy & Finance Committee), Mike Locke (Chairman, Future Energy Committee), Jake Burnyeat (Communities for Renewables - who have been managing the design stage works), Gill Jones (Infinite Renewables - who have led the generation system design work) and James Lancaster (Alderney Electricity - who has carried out an independent technical review of the design work).

The design work for a future system upgrade is now available on the Sark Community Power website. This will also be on display at the Island Hall, including photomontages of the proposed wind turbines from various viewpoints around the island.

There will be time for Q&A and an opportunity to meet the team afterwards. If residents have any detailed questions surrounding the design exercise that they wish to submit ahead of the meeting please contact the Policy & Finance Committee or Future Energy Committee.

Updates March 2025

Loan request to States of Guernsey to fund purchase Sark's power system

The issues associated with the Sark Electricity Limited (SEL) system are well known to islanders and do not reflect on the hard work of the local SEL employees in keeping the system running. Their job is more and more challenging as the system experiences an increasing number of difficulties which are the result of decades, not just years, of under investment.

There is an urgent need to bring Sark's electricity infrastructure into community ownership and carry out remedial works to ensure a safe and secure supply for the near-term. The wish is to reach a negotiated agreement with SEL to purchase the infrastructure (but not the company). The existing engineers and admin staff would be retained and the system would be run under a services contract with an experienced operator.

Costings

Chief Pleas has made a request to the Policy & Resources Committee of the States of Guernsey for a potential £1.5 million loan facility to purchase Sark's electricity infrastructure and complete the immediate safety work which is urgently needed.

Financial projections show the loan could be repaid out of electricity sales revenues at the current price cap of 54p/kWh. As a starting point, the Regulated Asset Value (RAV) calculated by the Electricity Price Commissioner is being used to assess the value of the current infrastructure but negotiations will need to take place around topics such as future revenues and liabilities. The current RAV is £425,392.

Additional budget has also been set aside for immediate safety works. Estimates of £300,000 to £500,000 have been arrived at by an independent electrical contractor with 20 years of experience working on the SEL system. These figures were also verified by Alderney Electric Limited by comparing them to the initial works carried out during their own grid upgrade project. A generous contingency has been built into this however as we cannot be sure about the extent of immediate works required until a physical inspection of the assets has been carried out.

Future system design stage work

Once the immediate safety work has been completed an assessment can be made as to what areas of the current infrastructure can be re-used and which areas may need replacing to secure the future of electricity supply on Sark.

The £175,000 design work agreed by Chief Pleas in January 2024 has produced an essential blueprint to cover a range of options for upgrading the current infrastructure. This vital design work has been undertaken in such a way as to follow the outline of the current high voltage network. This enables the design to inform any scenario from a complete replacement grid to a gradual and staged upgrade of the current network. A renewables-based system is one option that has been investigated in detail as this is a proven method that is being deployed worldwide to counter rising energy prices. The design work has highlighted the potential benefit of ownership of the current station and grid to enable Sark's electricity supplies to be provided in a safe, continuous and reliable manner, complying with internationally accepted standards.

The future partial or full upgrade of the generation and distribution system will require further investment. This investment will only go ahead if affordable without a significant increase in electricity bills. We will not know the extent of the upgrade required, and therefore the cost, until Sark has ownership of its energy infrastructure. The generation system needs replacing, which could be done in stages. Parts of the distribution system may be usable, which could significantly reduce costs. Initial enquiries have been made with the Crown, UK Government and private finance about possible sources of funding for a significant upgrade project. These options can only be investigated in detail once ownership of the existing assets is established and an assessment is made as to what areas can be re-used. The schedule and scope of any upgrade project may well depend on the rate and level of finance that may be available. Any decisions on extent of the upgrade work will be arrived at after extensive future public engagement. Purchasing the assets of SEL will allow the Sark Community Power project to evaluate the most cost-effective next steps in working towards an electricity system that will serve Sark residents for decades to come.

The future system design work was split into 2 packages. Sancus Utilities working with design consultants Auora Power led the design of the distribution system. Infinite Renewables led the generation system design.

Distribution system

The distribution system design is based on a complete replacement of Sark's electricity network. However, it has been undertaken in such a way as to follow the outline of the current high voltage network. This enables the design work to inform any scenario from a complete replacement grid to a gradual and staged upgrade of the current network.

Distribution system specification

- Designed to meet demand range from current demand of 90 – 400kVA to max demand of 2,500kVA (with ability to scale above that if and when needed).
- Able to manage diesel and/or renewables-based generation.
- Will run at 6.6kV (as per current system) with cables able to run at 11kV if required in future.
- Designed as a complete replacement system or basis of staged upgrade.

Design phase work included:

- Developed a model of current demand (based on the Cadastre database and assumptions for each type of property) and future load scenarios including Sark shifting to electricity for cooking, heating and transport. This confirmed 2,500kVA provides sufficient headroom for new properties, a shift to electric cooking and some electric heating.
- Explored 4 design concepts for the high voltage system and an outline design for the low voltage system (including 3-phase to all properties).
- Protection and earthing system design.
- Power system modelling and stress testing to validate the recommended design concept.
- Component specification and costing, civil works costing.

Existing system

- 6.6KV
- 3 legged ring + Little Sark
- 26 step down transformers



Figure 3-3: Existing Network

Replacement system

- 6.6KV
- 3 legged ring + Little Sark
- New main sub-stations at top Harbour Hill and Beauregard
- 12 step down transformers
- Cable route and sub-station locations similar to current



Figure 5-4: Hybrid Design with Central Substation

Generation system

The generation system design proposes a new island power station at Les Laches with generation from 2 wind turbines, a field of solar panels, a battery and diesel gensets providing

100% back-up. The system is designed to be installed in stages and upsized if necessary to meet future increased demand.

Generation system specification

- 2 x 225kW (30m tower and 29m diameter rotor) Vestas V29 refurbished wind turbines
- 510 kW solar farm (1 field / half an acre – East / West layout)
- 750kWh storage capacity battery (8 hours of current night time loads) in fire safe 10ft shipping containers
- 3 x 350 kVA diesel generators (in noise reducing containers) providing 100% back-up
- 'Micro grid' control management system
- A new power station building next to the abattoir to house the generators, workshop and low voltage distribution boards

Design phase work included:

- Planning: Photomontages of the wind turbines from island view points and consideration of noise and shadow flicker, ecology, radar and telecoms.
- Technical: Access feasibility, ground investigations and turbine foundation design, wind and solar resource assessment.
- Logistics plan and budget.
- Specification of a smart grid control system including system to enable 'heat tariff' for hot water and storage heating when there is a surplus of wind or solar.
- A renewables-based system with 100% diesel back is deemed viable, with wind and solar providing 80% of Sark's demand.

Sark is dependent on an electricity system that is obsolete, dangerous and not under our control. Something needs to be done. Whilst a daunting task, this is an opportunity for the people of Sark to establish a community-owned system that is safe, reliable, low carbon and scalable to meet future needs.

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