What opportunities and ideas are there that we can use in our Local Energy Plan to benefit our community?

Smart Meters are being rolled out in homes across the UK, replacing gas and electricity meters. They measure how much energy you are using and tell you how much it is costing so you are able to change your habits to use less energy and reduce your bills. With Smart Meters you will no longer have estimated bills because your energy supplier takes readings from your meter remotely and you only pay for the energy you use. They may also make it easier to switch supplier, if the suppliers use the same technology.[1]

Similarly **Energy Monitoring** equipment can be used to measure how much energy you are using, when you use it (day, season & year) and what temperature your house is. The data collected would enable you to tell if you could benefit from changing tariff and give you better control over heating to only provide heat when it is needed. This data can also be used to link local energy generation (e.g. from solar panels) with consumption (household or commercial) to help your community benefit from lower-cost energy generated locally.

Time-Of-Use tariffs (based on half-hourly readings) could be available with Smart Meters so you will be able to use energy when it is cheapest. With Smart Meters your community could offer different types of tariffs and develop new business models with customers and bill them accordingly.

Energy Clubs are formed by residents or businesses coming together to collectively buy power and benefit from reduced bills due to economies of scale. There isn't an off-the-shelf model available yet but some pioneering communities are working towards it.

Grid services are opportunities for larger energy consumers, or collectives of smaller consumers, to be paid to switch off or switch on energy generation or use to help DSOs or National Grid to manage the grid effectively. These are led by the network operator.

Demand-side response is a specific activity usually used in the context of grid services where intelligent appliances and demands switch on and off in response to signals requested from the grid.

Demand-side management is a broader term to describe activity that manages smart loads and appliances both to provide grid services but also balance grid locally for third parties and can be used to allow more generation in a given area. This can benefit householders and businesses by giving a reward for taking part (cheaper energy) while enabling more locally produced energy to connect and supply to the grid (balancing the grid by managing demand to match when there is a 'surplus' of supply). Check out the ACCESS Project on Mull for more information about a community project involved in DSM www.accessproject.org.uk

Smart Appliances such as electric vehicles, heat pumps and storage heaters can be controlled remotely enabling Demand-side Management or Demand-side Response. Heat Smart Orkney is a good example of DSR www.rewdt.org

[1] This technology depends on communications equipment which may not be available in Barra

Battery Storage systems can be used to overcome grid limitations. Energy from constrained generators, e.g. wind turbines, can be stored and fed back on to the grid when there is demand for the energy or stored and used for non-grid applications, e.g. transport. Read about the Isle of Gigha's battery project www.communityenergyscotland.org.uk/gigha-battery-overview.asp

Hydrogen storage can be used to replace fossil fuels for example for recharging batteries on ferries and powering road vehicles. Hydrogen gas can be transported to where it is needed. Check out the Surf 'n' Turf project in Orkney www.surfnturf.org.uk

Microgrids (Private Wire Networks) generate energy locally and connect it directly to demand through privately owned wires. If the demand is less than 2.5MW it is classed as *license exempt* and can operate with less paperwork. Microgrids can be beneficial if a generator is not able to connect to the distribution grid due to restrictions. They can operate in parallel to the public network or separate from it. Knoydart Renewables operate their own grid www.knoydart-foundation.com/about/about-the-foundation/knoydart-renewables/

Local Energy Economies is about maximising the local generation of energy and the local use of energy to keep the economic benefits in the local community. Read about the OHLEH project to find out more www.communityenergyscotland.org.uk/ohleh.asp

Local Generation Tariffs provide a virtual link (Virtual Private Wire) between consumers and a generator. In one example of a Local Generation Tariff a fully licensed supplier, such as one of the Big Six, will set up what is termed a *sleeving arrangement* with a generator and agree to buy their energy. The Supplier then sells the energy from the generator to customers who have signed up to the scheme. The customers' consumption is measured using Smart Meters and matched with the supply from the generator so the customers pay less for their energy.

Peer to Peer trading is an example of Virtual Private Wire. With Peer to Peer trading the electricity has to be used when the generator is generating.

Electric Vehicles are becoming more popular, one reason for this is that the Scottish Government plan to phase out new petrol and diesel cars by 2032. The challenge for the grid is in the management of increased electric demand from EV charging. This could be an opportunity for communities to increase local generation on constrained grids by supplying this new demand. Energy suppliers are coming into the EV market and offering a wider range of tariff options for home owners to charge their vehicles. Communities are looking at a wide range of electric vehicles including cars, ferries, boats and buses.

Bulk buying **insulation & draught proofing** homes and businesses will reduce energy consumption and provide warmer buildings. Some communities such as Sustainable Uist have undertaken Hard to Treat Homes projects to understand how best improve energy efficiency for homes in their area.

Significant funding is available for **Active Travel** including cycle to work schemes, travel hubs and walking and cycling paths.

The following table takes some of the opportunities and ideas being pioneered and used by other communities in Scotland and shows what benefits a community can derive from them. Once the community in Barra have fed back what priorities they want for Barra's energy future, the table can be used to see what sorts of projects, technology and ideas could help them realised those particular priorities.

There is room at the bottom to add your own ideas for opportunities and projects.

*The ticks show the benefits which **could** be achieved from each type of project, it doesn't necessarily mean it will achieve every benefit.

	Benefits / Potential Priorities											
Opportunities	Lowering Fuel Poverty	Warmer Homes	Lowering Carbon Footprint	Healthier Lifestyle	Lowering Energy Bills	Less Money	More Locally Generated	More Sustainable	More Sustainable Businesses	Cheaper	More Renewable Energy	Create local jobs
Smart Meters	✓		✓		✓	✓			✓			
Energy Monitoring	✓		✓	✓	✓	✓			✓			
Time of Use Tariffs	✓	✓	✓		✓	✓	✓		✓		✓	
Energy Clubs	✓	✓			✓	✓			✓			
Demand-Side Management	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Battery Storage			✓		✓	✓	✓	✓	✓	✓	✓	
Hydrogen			✓			✓	✓	✓	✓	✓	✓	
National Grid Balancing Markets					✓				✓			
Microgrids	✓				✓	✓	✓		✓		✓	✓
Local Energy Economies	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓
Local Generation Tariffs	✓	✓	✓		✓		✓		✓			
Electric Vehicles			✓		✓		✓	✓	✓	✓	✓	✓
Insulation & Draught-Proofing	✓	✓	✓	✓	✓	✓			✓			
Active Travel			✓	✓	✓	✓		✓		✓		