

Draft Scottish Government Energy Strategy
Community Energy Scotland Response

<p>1 What are your views on the priorities presented in Chapter 3 for energy supply over the coming decades? In answering, please consider whether the priorities are the right ones for delivering our vision.</p>	<p>1. Community Energy Scotland (CES) is Scotland's independent community energy support charity working to democratise the energy system. Our mission is to build confidence, resilience and wealth at community level through sustainable energy development. We do this by representing community energy issues in policy development and by supporting communities to develop and deliver their own energy projects. Over the last decade we have worked with hundreds of communities across Scotland to help them realise and benefit from their own renewable energy installations. More recently we have established the idea of 'local energy economies' in Scotland to help communities gain more of the financial and practical value of their renewable energy resources by developing opportunities for local use of the renewably generated energy. This locally focused notion offers the added benefits of mitigating network constraint issues whilst awaiting long-term network reinforcements and helping to substitute fossil fuels with local renewable energy across all sectors including heating and transport.</p> <p>2. CES develops and leads partnerships across the myriad of stakeholders involved in energy provision, including: individuals consumers; communities; tech and software providers; local authorities; developers; energy companies and network operators. These partnerships are driving forward innovative local energy developments which maximise local benefits whilst also assisting the national energy system's sustainable transition. Examples of these types of local energy economy projects include: the Mull ACCESS project¹ and the Orkney 'Surf 'n' Turf' Project².</p> <p>3. We strongly support the approach and ambition laid out in the draft strategy, in particular its integrated approach and the ambition in its targets, especially:</p> <ul style="list-style-type: none"> ○ the proposed 'all-energy' renewable target to deliver the equivalent of Scotland's heat, transport and electricity consumption from renewable sources; and ○ the idea of a new 2030 energy efficiency target
---	---

¹ 'Assisting Communities to Connect to Electric Sustainable Sources – see [here](#) for more information

² Hydrogen generation from a constrained community wind turbine. See [here](#) for more information

aligned with the EU ambition of a 30% energy efficiency improvement;

- The importance the strategy attaches to local and community energy solutions and the development of local energy economies.

4. The draft strategy represents the first coherent attempt in the UK to set out a 'whole system' integrated approach to energy policy, bringing together key aspects of supply and demand in the context of the low carbon imperative, rapid technical innovation and the significant changes that are underway in the generation, supply and use of energy.

5. However, although the draft refers to the importance of sharing benefits across communities, innovative work on local energy systems and the significance of consumers' response in determining the future energy mix, the strategy could have a **stronger vision for the role communities could play in this transformative process** and **what they need to have in the way of support** so that they can engage and effect change within the required timescales. In particular, there is a need for:

- An **active programme of knowledge transfer and capacity-building on local energy systems** and associated regulatory issues;
- Measures that **'lever' and reward local community organisations' capabilities** in influencing local consumer behaviour and local demand reduction and response;
- Measures that encourage energy companies and DNOs to enable the **proper valuation of this role** in the energy transition, particularly in relation to the benefits local generators and aggregated demand can bring to the operation of the grid;
- An active programme of **local energy 'master planning'** with supported community group engagement as a basis for the wide-ranging partnerships that will be necessary to realise the opportunities at the local level. This should include:
 - Increasing the **transparency of electricity network reinforcement costs and use of system charging**, to facilitate the development of new business models for local supply and balancing
 - Making available **national / regional electricity demand profile maps and databases** which are necessary to assess opportunities for local balancing

Although working to build the capacity of communities to

engage can take longer than direct consumer marketing or 'community-benefit' arrangements linked to private renewable energy developments, we believe that the long term socio-economic, carbon and behaviour change benefits can be much greater, especially at the local level.

6. At a more basic level, we are concerned that the idea of supporting **wholly community owned** energy projects is fading from view owing to the erosion and removal of FiTs and ROCs and a sense that renewable energy projects should be 'subsidy free'. It is particularly frustrating that community projects are caught in this trap when collectively they have received less than 1% of the FiT budget and generate local value which is disproportionate to privately owned projects. We remain of the view that there continues to be a case for a '**Community Fit**' or **equivalent** and that pressure should be maintained on the UK Government for this measure.

7. We believe that it is important to recognise that, from the local perspective, community energy projects are not just a matter of generating or saving energy, but are driven by both the direct and indirect local socio economic benefits that they offer as well as the potential they have to quite radically contribute to a more cost-effective and decarbonised energy system. The beneficial socio-economic impacts have been recently confirmed in work by Okkonen and Lehtonen³ who are clear that the reinvestment of income from renewable energy in the local economy, particularly by community driven social enterprise, drives a tenfold increase in local employment and income impact (and associated socioeconomic benefits) compared to commercial renewable developments.

8. The 'prize' community energy offers and what we believe should be encompassed in the strategy vision is a much greater level of direct local renewable energy supply for local electricity, heating and transport demand, substituting for continuing widespread fossil fuel use, overcoming electricity system constraint blockages on new development, minimising the need for expensive reinforcements and transmission losses, creating opportunities for new local investment and tariff arrangements which help to recycle value in the local economy, earning new revenue through provision of local balancing and grid services, demand aggregation and response and contributing to fuel poverty alleviation through better heating provision and tariffs. Critically, it also offers a much more engaged and aware

³ L. Okkonen, O. Lehtonen, Socio-economic impacts of community wind power projects in Northern Scotland, Renewable Energy 85 (2016) 826-833.

	<p>citizenry which goes beyond the traditional model of 'top down' energy provision to consumers to 'bottom up' engagement, supply, innovation and influence on how the whole system operates.</p> <p>9. Clearly not all consumers or community groups will have the resource or ambition to actively engage in the provision of their energy needs; however community energy solutions – like the energy system as a whole – are rapidly evolving and widening in scope to encompass the whole chain of generation, supply and use of energy. In this sense, community energy development should be seen as not just an integrated energy policy concern but also a practical basis for integration with wider social and economic development policy and practice especially relating to community empowerment, regeneration and the retention of value in local economies. We are not aware of an equivalently powerful and cross-cutting example of sustainable development in practice and would be pleased to contribute to the definition of a new action plan to realise this ambition.</p>
<p>2 What are your views on the actions for Scottish Government set out in Chapter 3 regarding energy supply? In answering, please consider whether the actions are both necessary and sufficient for delivering our vision.</p>	<p>We welcome the actions presented to further the priorities outlined in chapter 3 of the strategy, particularly in relation to new energy sources, increasing renewable generation, and increasing flexibility, efficiency and resilience. As Scotland's community energy charity we represent community groups who will have a crucial role to play in achieving these priorities.</p> <p>The role of collaboration within the actions for all priorities in chapter three is necessary, however we consider that community energy, represented by community groups and intermediaries must be involved in the process to deem it sufficient. Community projects are leading demonstrations for new technology such as hydrogen fuel (Surf 'n' Turf on Orkney, Levenmouth Community Energy project), and will also play a key role in engaging large groups of consumers as they are exposed to the technical and commercial complexities involved in system flexibility. They are also enabling the connection of further renewable generation through innovative ways to overcome grid constraints with local balancing. Furthermore we consider that communities should be involved stakeholders within discussions regarding regulation on District Heat Networks and Local Heat and energy Efficiency strategies. Here community groups will be able to contribute learning to understand the impacts of potential regulation, and also ensure that they are able to access the benefits of such developments.</p> <p>With regard to the action for shared ownership we welcome the principal behind the provided target. However, it is always preferable for projects to have both ownership and involvement from community groups, ideally as project partners. Involvement</p>

	<p>in projects can be just as important for communities, in terms of capacity building and local employment, as the benefits of simply owning a financial stake. In this sense we feel that to make this action sufficient, the target needs to be for true community <i>partnership</i>, thus always looking to progress levels of community involvement and ownership as per the hierarchy published by the Scottish Government in the 2015 community energy policy statement.</p>
3	<p>What are your views on the proposed target to supply the equivalent of 50% of all Scotland's energy consumption from renewable sources by 2030? In answering, please consider the ambition and feasibility of such a target.</p> <p>We support this ambitious target which will strengthen Scotland's ability to meet pressing carbon reduction targets but also continue and reinforce Scotland's position at the forefront of low carbon development. We believe that it is feasible, but, if it is to be realised, will require a fully integrated approach across the electricity, heat and transport sectors along with the planning, policy and regulatory environment within which they sit. This will be challenging, especially as elements of this are retained by the UK Government. Accordingly it will important to be clear on the scope the Scottish Government has to drive all the measures that will be necessary to achieve the target. Please also see comments in response to question 1.</p>
4	<p>What are your views on the development of an appropriate target to encourage the full range of low and zero carbon energy technologies?</p>
5	<p>What ideas do you have about how we can achieve commercial development of onshore wind in Scotland without subsidy?</p> <p>From the community ownership perspective, the small scale and, by definition, localised nature of community energy developments means it is difficult to achieve the economies of scale necessary to drive costs down. We believe that there remains a case for subsidy for local, community-owned onshore wind where such projects could have a significant local economic and regenerative impact – in other words, where there are benefits that go beyond decarbonisation and generating electricity at grid parity to fulfil other important socio-economic policy objectives. The beneficial socio-economic impacts are demonstrated in work by Okkonen and Lehtonen who are clear that the reinvestment of income from renewable energy in the local economy, particularly by community driven social enterprise, drives a tenfold increase in local employment and income impact (and associated socioeconomic benefits) compared to commercial renewable developments.</p> <p>We also believe there is scope for promoting a collective approach to larger-scale 'third sector' developments, whereby community and third-sector groups are facilitated to develop jointly-owned project in appropriate locations in Scotland.</p>
6	<p>What are your views on the potential future of Scotland's decommissioned thermal generation sites?</p>
7	<p>What ideas do you have about how we can develop the role of hydrogen in Scotland's energy mix?</p> <p>'Green' hydrogen production (ie from low carbon electricity) is one of the most scalable and adaptable community level technologies currently able to store renewable energy at all times of year and arguably creates the largest potential for</p>

reducing carbon, and increasing (local) value and utilisation of huge levels of renewable energy resource across Scotland: by unlocking current and future bottlenecks that are building through limitations to infrastructure and intermittency of generation. Utilising hydrogen as a portable fuel or as a chemical resource and precursor to high value products (such as oxygen and fertilizer) also achieves greater local benefit than simply regenerating the electrical input energy.

Transport. While hydrogen (H₂) road vehicles remain at a low level of market penetration compared to electric vehicles (EVs), their range and short refuelling time offer user advantages that are especially relevant to sparsely populated areas. Recent activities (such as those demonstrated under the Horizon 2020 supported BIG HIT project in Orkney) are also starting to demonstrate how corporate fleets of EVs equipped with H₂ range extenders can become economically interesting and operationally advantageous, provided the H₂ infrastructure is available.

On the H₂ supply side, there are significant positives for legacy infrastructure, for instance hydrogen refuelling does not present the same challenges on electrical infrastructure as rapid EV charging does. CES recognises that a transition from fossil fuel to clean alternatives will require major financial and technical investment. As such we would recommend that the first areas of investment should be transport that consumes the most carbon fuel and/or has the biggest negative health implications, such as ferries and buses. Fuel cells and modified internal combustion engines are relevant technologies. Examples H₂ buses in Aberdeen, EVH₂ Kangoos in Levenmouth, STEP H₂ taxis in Paris, H₂ train in Germany, BeeZero H₂ carpool in Munich. There is scope for much greater community engagement in this development area as shared transport (car pools, taxis, community buses) are all services used – and provided by – community organisations.

Heat. In national gas grid areas, the opportunity exists to reduce the carbon footprint of mains gas with hydrogen injection. In islanded grid areas (eg Thurso/Wick) the high delivery cost of natural gas makes community energy based on local production of alternatives easier to justify financially. In areas without piped gas, the tradition of bottled LPG provides the easiest conversion opportunity as long as safety issues – both real and perceived– can be addressed.

As with transport, given the significant requirements of converting buildings to safe hydrogen use, a focus on larger sites – community buildings and district heating –would be an ideal opportunity to establish a bridgehead and provide early

assurance to aid adoption, however it is worth noting the significant and advanced development of commercially available fuel cells for domestic application in Japan.

Feedstock. Natural gas and petroleum are important chemical feedstocks, typically deployed at industrial scale, in part for historic reasons. Hydrogen, potentially alongside sequestered carbon dioxide and atmospheric nitrogen, offers a route to community-scale production of commodities for farming, food processing etc at the point of use. Oxygen associated with water electrolysis is a further output with value across rural/urban Scotland, eg water treatment, aquaculture or health services, as is hoped to be demonstrated through the Scottish Government support OHLEH Challenge Fund project, and as also could be extended to process heat.

Grid stabilisation. Current PEM electrolyzers are better suited to variable power input than previous alkaline technology. They therefore have a role to play both in absorbing peaks of renewable demand and, by extension, in allowing more renewable generation to connect. Equally PEM fuel cells are suitable for peak-demand coverage with reactivity comparable to or better than both hydro or CCGT, with response from cold times of seconds rather than minutes. The scalability of storage allows a better use of the grid by smoothing the intermittent nature of renewables and/or variable demand, again, as currently being demonstrated through the Scottish Government supported Surf n Turf Challenge Fund project. At community and local/distribution grid level, we are now showing that a suitably sized wind/hydro turbine can have much less reliance on, and may soon even no longer need, a grid connection to provide local energy if the surrounding area has the supply chain and infrastructure to make use of hydrogen. Activities like these show real ways forward that we can still make best use of the existing grid assets and maximise our carbon reduction, whilst still maximising the value of incredible local and national renewable resources. In the System Operability Framework 2016, National Grid has predicted a widespread growth in areas requiring networks to be actively managed and that covers pretty much all of Scotland. Hydrogen can play a key role within existing infrastructure with a better value for money, covering more aspects than upgrading infrastructure only.

Grid resilience. Diesel generators at domestic and large scale are a standard fallback for homes, businesses, infrastructure services and indeed Distribution Network Operators in remote areas. Their standalone nature again opens up possibilities for gradual substitution with hydrogen technology. Trained up with 21st century skills, communities can take responsibility for their

	<p>own critical infrastructure through smart local energy.</p> <p>Key work is required on policies to encourage and facilitate the integration of hydrogen systems into the existing network, in particular pricing mechanisms, electricity/gas regulations and Research and Development.</p> <p>Increased public awareness will be required to increase knowledge and acceptance of H2 technologies. Although the incident happened nearly a century ago, the Hindenburg event is still too often, wholly erroneously, linked to hydrogen in popular perception. Natural gas-grids are socially accepted while similar risks intrinsic to pressurised energy systems exist.</p> <p>Development of programmes facilitating access to training in order to prevent skill shortages applied to hydrogen technologies. An increasing body of information and number of training courses are becoming available in the UK and in Europe (knowHy, HyResponse) but shortages are identified in key areas of opportunity, like marine transport for example.</p>
8	<p>What are your views on the priorities presented in Chapter 4 for transforming energy use over the coming decades? In answering, please consider whether the priorities are the right ones for delivering our vision.</p>
9	<p>What are your views on the actions for Scottish Government set out in Chapter 4 regarding transforming energy use? In answering, please consider whether the actions are both necessary and sufficient for delivering our vision.</p>
10	<p>What ideas do you have about what energy efficiency target we should set for Scotland, and how it should be measured? In answering, please consider the EU ambition to implement an energy efficiency target of 30% by 2030 across the EU.</p>
11	<p>What are your views on the priorities presented in Chapter 5 for developing smart, local energy systems over the coming decades? In answering, please consider whether the priorities are the right ones for delivering our vision.</p> <p>Broadly we feel that the priorities set in Chapter 5 by the Scottish Government are the right ones. The work already undertaken to develop smart, local energy systems need further support to develop in a way that will allow communities and partners to actively participate in them, while also being able to extract sufficient benefits. Piloting and demonstration through further innovation projects is essential for this agenda to develop. Technology and services are yet to mature, as well as sufficient commercial arrangements and accompanying regulations to allow the market to develop and support current innovation.</p> <p>Community Energy Scotland recently hosted a two-day residential workshop with stakeholders from across the UK on the topic of Local Energy Economies. One major , priority identified</p>

	<p>which is not currently touched on by the Strategy was the accumulation of network system data alongside that held by Distribution Network Operators (DNOs). New electricity grid connections based on innovative local solutions often require significant input and communication with DNOs so that they can be comfortable with innovative proposals. Better access to data underpinning, reinforcement costs, demand profiles and local balancing potential and use of system charging is required in order to meaningfully and efficiently propose workable solutions with which DNOs can engage. This network-wide overview and more comprehensive information is also essential to work out charging for new business models.</p>
<p>12 What are your views on the actions for Scottish Government set out in Chapter 5 regarding smart, local energy systems? In answering, please consider whether the actions are both necessary and sufficient for delivering our vision.</p>	<p>We think there are some additional measures necessary in order to achieve the goals of 'maximising wider system benefits'. We are in complete agreement that further financial support is required under existing initiatives such as CARES. However, our project development experience and feedback from community groups and industry stakeholders has highlighted specific requirements that could be addressed within these funding schemes, such as:</p> <ul style="list-style-type: none"> • The schemes could strengthen support for business case development to ensure long-term viability and sustainability of projects in a post-grant/subsidy environment. Community groups will need to spend additional time and effort developing viable propositions post-subsidy. This support would be useful now so that business models can be codified and shared amongst community groups as the sector matures. • We welcome the inclusion of energy master planning as a whole systems approach to involve communities in developing projects alongside wider actors and stakeholders in a given location. For this to meet its potential, the key players who regulate or determine energy system development need to be fully signed up to the process of preparation so that it does not become a marginal activity. The Scottish Government has an important role in helping to make this happen. • In relation to the point on data in our answer to Q11, we propose that the Scottish Government considers how it might support the provision of network data to support project scoping and development.
<p>13 What are your views on the idea of a Government-owned energy company to support the development of local energy? In answering, please consider how a Government-owned company could address specific market failure or add value.</p>	<p>We have mixed feelings about this idea and would be concerned if anything were done which would impact adversely on Community Energy Scotland's role. The pressing need for a GOEC is not immediately evident and the risk would be that it would take away from existing initiatives and activities undertaken by a wide range of bodies. Although each of the potential roles identified are, or could be important, it is not clear whether any of these warrant the creation of an entirely</p>

	<p>new entity, or whether they could be delivered through existing mechanisms – this should be explicitly addressed.</p> <p>There may be a role for a GOEC as a means of collective service provision and sharing resources between community groups. For example, there is interest in the idea of community energy supply companies to provide innovative local energy solutions and associated tariffs. However, some aspects of operating supply companies are operationally onerous to establish and would work better through economies of scale. Is there a case for a GOEC that can provide the 'backroom' services of a supply company for community organisations?</p> <p>Similarly, is there a case for a facilitating body to help realise the development of larger scale joint venture 'third sector' projects referred to above? Ideally, this is the sort of development CES would take forward, but is difficult owing to the risk and upfront capital requirements.</p> <p>A GOEC could potentially play a useful role in aggregating community generation / supply in relation to the idea of a Scottish Government PPA / Sleeving arrangement, although this would require further development work to understand how this might work in practice.</p> <p>Finally, the energy master-planning process could benefit from the impetus and discipline a government body could bring, including in relation to data acquisition and provision (as discussed above) as well as technical support to local master planning partnerships.</p>
<p>14 What are your views on the idea of a Scottish Renewable Energy Bond to allow savers to invest in and support Scotland's renewable energy sector? In answering, please consider the possible roles of both the public and private sectors in such an arrangement.</p>	<p>We support this idea but would be particularly interested to explore the scope for a specific 'community energy bond' for investors who would particularly like to support projects which bring strong and specific local community benefits, rather just seek a commercial return. We would be pleased to contribute to the further development of this idea.</p>
<p>15 What ideas do you have about how Scottish Government, the private sector and the public sector can maximise the benefits of working in partnership to deliver the vision for energy in Scotland?</p>	
<p>16 What ideas do you have about how delivery of the Energy Strategy should be monitored?</p>	
<p>17 What are your views on the proposed approach to deepening public engagement set out in chapter 6?</p>	<p>As referred to above, we would like to see more support for community engagement and capacity building on new technologies, storage, communications and control elements, and the commercial arrangements and regulations that govern such systems. Community groups would benefit from appropriate financial and technical support to build sufficient capacity to actively engage with projects, and gain a sense of</p>

	<p>ownership and control alongside technical and commercial partners. This investment would also be worthwhile in relation to the trust and behavioural change it normalises within local communities and the 'buy-in' for the long term success of local energy projects it allows. Fundamentally, a more engaged and aware public increases the likelihood that local economic, social and environmental benefits will be realised and retained locally whatever the scale of the activity.</p>
--	---