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Transforming Scotland with Solar Energy

Final Report

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Scottish Universities Insight Institute

Collins Building,
22 Richmond Street
Glasgow G1 1XQ

www.scottishinsight.ac.uk

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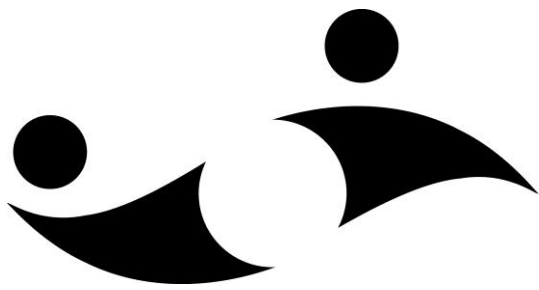
Main Objectives and Context

The low awareness in Scotland of the potential benefits of solar energy was the context for the programme. The benefits of all types of renewables include business opportunities and mitigating climate change, however in the case of solar there are additional important contributions that can be made, including alleviation of fuel poverty, security of energy supply through distributed generation and providing local assets for community ownership. In recent years drastic reductions in the cost of solar technologies, in particular photovoltaics (solar electricity), mean that solar is becoming increasingly cost competitive with other renewables and will eventually compete on price with fossil fuel energy. There can be a perception that Scotland is not a sunny country, as insolation levels are lower than more southern countries, however the vast total solar resource means that even in Scotland solar energy can be a major energy source. The “2020 Routemap for Renewable energy in Scotland” (Oct 2012 update) contained no section on solar energy. The Dec 2013 update contained only a one-page summary with a purely business-related focus and did not cover the diverse range of opportunities solar energy could contribute to Scottish life. This can be contrasted with the International Energy Agency forecast that solar energy could be the largest source of electricity worldwide by 2050.

In this context, the project aimed to gather and establish key facts relating to solar opportunities in Scotland, to identify barriers and pitfalls relating to uptake and to disseminate outcomes widely to promote understanding of the key conclusions. The scope of the project included both solar photovoltaics (sunlight to electricity) and solar thermal (sunlight to heat) technologies. The central organisation driving the project was the Scottish Institute for Solar Energy Research (SISER), an alliance of around 30 academics across 11 Scottish Universities, also supported by the Energy Technology Partnership, AES Ltd and the Scottish Solar Energy Group.

Main outputs and Impact

The project was carried out in three phases, with the final objective being to produce a summary report for dissemination, outlining the opportunities, barriers and desired actions for Scotland to fully benefit from solar technologies. The first phase involved a one-day workshop held at the SU11 facility in Glasgow, which brought together experts from academia, solar industry, renewables, national government, local government and overseas (Germany). Initial presentations were given covering lessons on the solar experience in Germany, business opportunities, the urban and rural perspectives and emerging technologies. Each of these themes was followed up in break-out sessions involving extensive notetaking, written up into an initial summary report. The second phase involved short research topics to obtain and



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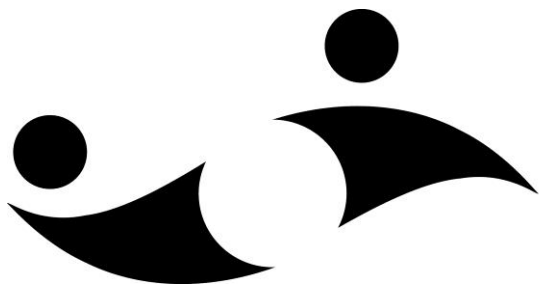
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collate some key Scotland-specific facts that inform the prospects for benefit in Scotland. The final phase involved writing of the concluding document “A Solar Vision for Scotland”, which was launched at the Scottish Parliament in May 2014. This is the first document to provide a summary and comprehensive outlook for solar in Scotland across all aspects: urban/rural social benefits, renewables obligations and business opportunities.

The core output of the programme was the Solar Vision for Scotland document. This is the first comprehensive overview of solar energy in Scotland, and it touches upon social and community aspects as well as business opportunities and renewables obligations. The Vision was launched at an event in the Scottish Parliament in May 2014, attended by around seventy representatives from the following organisations:

Sustainable Opportunity Solutions Ltd	Orbit Communications	University of Dundee
Rexel Energy Solutions	Local Energy Scotland	University of Edinburgh
Fife Council	iPower,	Scots Renewable Energy Ltd
Interface - The knowledge connection for business	Scottish Renewables	FES Renewables
BE Renewables	Solarbuzz	ICCC
WWF Scotland	University of Glasgow	Forster Group
Hewden	Edinburgh Napier University	Alternergy Ltd
40c Edinburgh Ltd	Glasgow Caledonian University	AES SOLAR
Solar Cities Scotland	Lightsource Renewable Energy Ltd	Edinburgh Centre for Carbon Innovation
Begetube UK Ltd	Business Gateway	CCL Components Ltd
ecoConnect	Carbeth Eco	trilight
Scottish Government	The Solar Design Company	Eco-Power Innovations Limited
Creative Carbon Scotland	Absolute Solar & Wind Ltd	Scottish Development International
ESGP	Solar Energy Systems	Daima Energy, Positive Solutions
The Mark Group	iPower Energy Ltd.,	The Launchpoint
Sustainable Opportunity Solutions Ltd	Ross Development & Renewables Ltd	Gridpostone Limited
Ecofitter,	Edison Energy	Community Energy Scotland
Optimat Ltd	Anderson Strathern LLP	Solar Media
two Members of the Scottish Parliament		

The event comprised presentations summarising the business, renewables and social aspects of solar energy and provided an opportunity for mixing and networking of participants. This was undoubtedly the first gathering of such a comprehensive range of solar interests to have taken place in Scotland. The Vision report has been publicly available on the SISER website (www.siser.ac.uk) since the launch and has been



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proactively promoted to the launch attendees, and also an extensive list of other potentially-interested parties since the launch. For this, an email list of over 300 contacts was used. The list has been compiled by Dr. Anne-Marie Fuller, the Business Development Executive for Solar from the Energy Technology Partnership and one of the leaders of the project. Press coverage at the time of the launch included articles in the Herald, Scotsman and BBC website as well as other web sources. The Solar Vision for Scotland appears to have become embedded in the solar thinking within Scotland and for example was cited in a Scottish Renewables business event (Shining Light on solar Power in Scotland) run by Pincent Mason on 11th September, and was cited in the report “Initial Potential Capacity Assessment for the Implementation of a Scotland-Wide Solar Water Heating Systems Installation Plan in the Domestic Sector” prepared for the Scottish Government by a research team at Heriot Watt.

Key Recommendations

The Solar Vision for Scotland included an Action Plan to clarify and stimulate future actions to fully exploit the potential of solar energy. This includes actions identified for the political, business and academic communities and was specified in the document within six key action points as follows:

Action 1- Developing a Common Vision

Objective: Develop a common vision and solar strategy for Scotland

Actions: Recognise the huge growth anticipated over the period to 2020 under the current incentive regimes (FiT, RHI and ROCs). Plan to maximise Scottish benefits (including jobs, zero-carbon buildings, social returns in cities and rural communities, novel products and niche IP). Define and confirm an action plan to achieve these. Identify Scotland’s “solar champion”. Establish a leadership group.

Context: Solar energy is a practical option for Scotland

Solar energy is key to achieving “nearly zero” buildings. The short to medium term opportunity is in installation and generation. Current UK PV incentives (FiTs scheme and RO) encourage investment so additional fiscal instruments are not required. The stability of UK incentives has been a major factor in market growth.

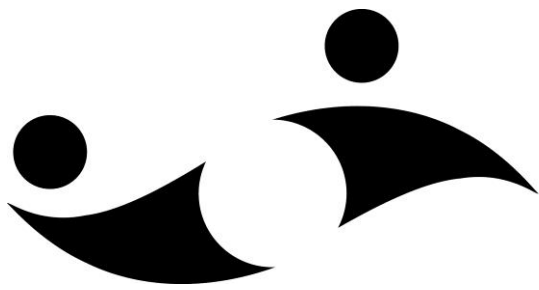
Responsibility: Government, industry and academia joint action

Action 2 - Encouraging Short Term Adoption

Objective: Promote solar as an attractive renewable source

Actions: Raise awareness and promote existing incentives

- FiTs for building applied PV
- ROCs for solar farms
- RHI for solar thermal



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Identify additional financial instruments required to support existing schemes. Develop best practice case studies. Develop and publicise demonstrator projects Solar Energy – A Viable Contributor to Renewables in Scotland.

Context: Investment in solar PV energy and solar thermal heat generation in Scotland are both financially and environmentally attractive

Responsibility: Industry with government support

Action 3 - Integrating Solar in the Wider Scottish Renewables Strategy

Objective: Integrate solar as a core part of the Scottish renewables strategy

Actions: Engagement with key stakeholders

- Other renewables sectors
- Grid and storage sector
- DNOs
- OFGEM
- Council planning departments

Address challenges from increasing solar energy generation

Context: Solar energy is a practical option for Scotland. Solar energy is key to achieving “nearly zero” buildings

Responsibility: Government with industry and academic support

Action 4 - Developing Sustainable Buildings

Objective: Demonstrate the value of solar in achieving (nearly) zero energy buildings

Actions: Review requirements to meet EU and national targets, Define the role of solar, Address barriers to development (e.g. regulation), Build on best-practice elsewhere, Engage in European networks (e.g. Solarrok), Develop case studies and demonstrators

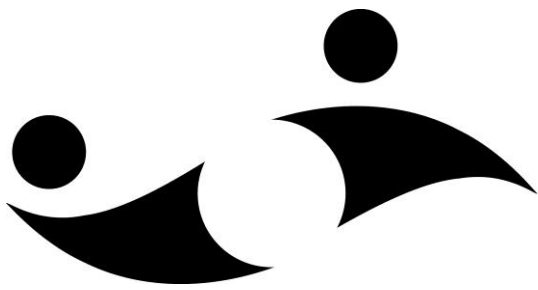
- “Nearly-zero” buildings
 - Community based energy models
- Establish innovative development options
- Public procurement
 - Design competitions for public buildings

Context: Solar energy is key to achieving “nearly zero” buildings

Responsibility: Government, industry and academia joint action

Action 5 - Monitoring Progress and Assessing Impact

Objective: Monitor development and impact of solar in Scotland



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Actions: Monitor economic impact

- Jobs
 - Gross Value Added (GVA)
- Monitor environmental impact
- Installed capacity
 - Energy generated
 - Energy efficiency – domestic, industrial and public buildings
- Monitor social impact
- Develop models for “social benefits” / social “rate of return”
 - Impacts on social housing and fuel poverty

Context: The application of solar is growing rapidly. It is important that its growth and impact are monitored.

Responsibility: Academia with government and industry support

Action 6 - Developing a Longer Term Road-Map

Objective: Develop a the way forward for solar in Scotland to 2025 and beyond

Actions: Map out market development

- Raise awareness of all solar options
 - Energy self-sufficiency demonstrators in rural areas
- Review technology options / developments
- Assess suitability for Scotland
 - Optimise solar PV for Scottish conditions
 - Assess maturity of BIPV and architectural options
- Assess industry development options
- Identify options for local supply chain development (manufacturing?)

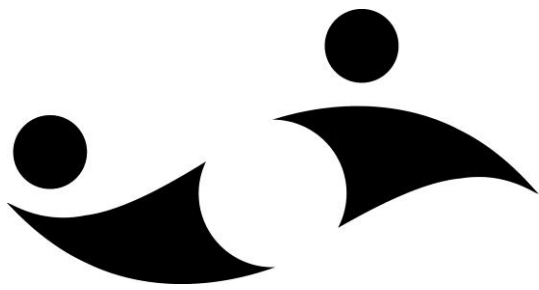
Context: Solar energy is a practical option for Scotland, Solar energy is key to achieving “nearly zero” buildings

Responsibility: Government, industry and academia joint action

Follow up Activities

Following publication of the report the project leader has met with a series of representatives from Scottish Government and other organisations to raise awareness of the conclusions and to secure future action. Meetings have included: Mike MacKenzie MSP, Sue Kearns (Head of Scottish Government Renewables Strategy and Onshore Renewables), Jonathan Robertson and Jamie Macleod (Onshore Renewables and Community Energy, Scottish Government), Stephanie Clark (Scottish Renewables), Malcolm Fleming (Scottish Government special advisor on Energy, Rural Affairs and the Environment).

Further communications by phone or email have also taken place with Dick Winchester (Scottish Energy Advisory Board), Dougie Wands (circulated the Solar Vision document to the Economy, Energy & Tourism Committee) and Richard Howard (Scottish Enterprise). Written communication from the office of Fergus



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Ewing MSP (Minister for Energy, Enterprise and Tourism) has stated his support for the ongoing discussions with government officials.

It has been clear from these meetings that awareness of solar energy in Scotland is rising and that the project has made a significant contribution to this. This is also apparent from the current activity by Scottish Renewables to set up a Solar Network. The open invitation for relevant organisations to join (http://www.scottishrenewables.com/media/uploads/hidden_links/solar_proposal.pdf) cites the Solar Vision document: "... we met with Scottish Government officials on the 24 September to discuss the future of the solar industry in Scotland. The aim was to consider how to further develop A Solar Vision for Scotland <http://www.scottishinsight.ac.uk/Programmes/Programmes201314/TransformingScotlandwithSolarEnergy.aspx>". The meeting of the 24th September mentioned above, was initiated by myself to discuss the Solar Vision with Government and Scottish Renewables.

Recent communication with Jamie Macleod (Onshore Renewables and Community Energy, Scottish Government) has indicated that Scottish government awareness and commitment to solar is growing. They are exploring further developments to form a common vision for solar in Scotland and to develop a solar action plan. They will be building on the work done in producing the Solar Vision for Scotland document and will be using the Scottish Renewables Solar Network to link with the solar community in Scotland.

This SUII project was always intended to be a one-off activity to help kick-start the interest in solar energy in Scotland and showcase the potential benefits. The intention was that other organisations (Scottish Government, Scottish Renewables) would subsequently take up the role to further develop the vision into the future. The above meetings and actions show that this now seems to be happening.