

**Re-energising Wales project objectives**

**Objective:**

To provide a quantitative, costed and timed programme of energy saving and generation to exploit Wales’ renewable energy resources (terrestrial and marine) in order to meet, by ~2035, Wales’ projected energy demands, maximizing the contribution from community and locally-based enterprises compatible with good economic practice, resulting in an 80% reduction in energy- related greenhouse gas (GHG) emissions.

(N.B. This phraseology does not cover non-energy related GHG emissions, mainly methane, carbon dioxide and nitrous oxide from the land use and the food chain, which will use up any residual permitted GHG emissions.)

**Indicative Work Programme:**

**Maximising energy efficiency & demand management**

Led by: Professor Ian Knight and Professor Gareth Wyn Jones

• To estimate within an overall objective of energy saving, the likely demands for electrical and non-electric heat energy and any other specific energy requirements through to 2035.

• To establish a framework to collect and report on operational data, in order to help collate temporal and geographical data and better understand what drives/causes energy demand and how will changes in these affect what we need. The framework will be used to help understand when, where and what level of supply capacity changes are needed in different geographical areas in light of proposed demand changes.

• Explore the potential social, economic and environmental impacts of a range of energy efficiency and energy saving measures leading to an overview of energy efficiency in Wales – current and potential. This will result in the publication of a report outlining a number of recommendations/options/scenario's for reducing energy demand and increasing energy efficiency in Wales, compatible with high welfare/living standards.

**Developing an energy portfolio/systems vision**

Led by: Professor Stuart Irvine

• Using the Swansea Bay City Region as a case study to model demand and likely scenarios for supply through different forms of renewable energy to meet these demands. This will include a detailed assessment of the technical/engineering requirements for exploiting renewable energy sources in Wales taking into account the current capacity of the National Grid, the intermittence and seasonality of renewable electricity generation; supply-side balance, demand management, energy storage in a 24h to an annual cycle and the role of smart grids and relationship between local/municipal grids and national/international grid

• An overview of energy generation – current and potential for renewable energy across Wales leading to an estimate (taking into account the results of the “Maximising energy efficiency & demand management” work package) of renewable energy generation potential and how it matches the likely demands for electrical, non-electric heat energy, transport and any other specific energy requirements on a decadal basis through to 2035, balancing supply and demand at various levels from the local to the supranational level.

• Assessing the environmental implications of different renewable energy sources and impacts of their exploitation noting the main likely conflicts

**Setting the economic parameters**

Led by: Professor Calvin Jones

A detailed assessment of the economics of developing a robust, fit-for purpose, modern and sustainable renewable energy supply for Wales. This will include;

• A quantitative estimate of the costs of the various sources of renewable energy (mainly electricity and heat) addressing the possible addition value of community/local schemes and any comparative advantages and risks of other sources including nuclear and carbon capture and storage.

• An estimate of the cost involved in grid re-engineering, smart grid, electricity storage and other aspects of the overall strategy; funding sources; consumer costs; economic gains from community local schemes. This includes an assessment of what would be required to enable changes in infrastructure and a transition to a decentralised local energy model. This also includes an appraisal of the wider economic framework within Wales including an assessment of how to move away from an inflexible and vulnerable model focused on foreign direct investment and a non diverse economic portfolio.

• An assessment of the economic tools and sources of finance to incentivize energy efficiency from the household and business level through to planning.

**Social and community issues**

Led by: IWA, Keith Jones and Professor Judith Marquand

Consultation and dialogue with government and engaging with communities leading to an assessment of the putative values of community engagement in energy saving and generation and an understanding of perceived community reluctance to embrace existing (and new) technologies.

• An assessment of the viability of community renewable energy projects across different geographical locations in Wales

• Within this work package we would also work directly with a sample of communities where;

* + renewable energy projects and local innovation have been a success in order to highlight good practice,
  + renewable energy projects haven’t been realised due to barriers
  + where renewable energy projects have failed when implemented

Within these communities we would explore the barriers to community engagement in energy saving and take up of local models for renewable energy generation technologies and how to overcome these using crowdsourcing techniques. We would also be keen to assess the social, environmental and economic impacts from the constraints and benefits of this local model.

**Regulatory and political challenges**

Led by: IWA, Professor Gareth Wyn Jones

To assess the powers required by WG and Local Authorities to implement the strategy. Relationships with DNOs, National Grid Plc and Ofgem, Planning, Highway and Railway authority

• An assessment of what Welsh Government can achieve with its current powers when aiming to implement an energy model which is of most benefit to Wales,

• An assessment of whether further powers for the Welsh Government would be required to drive a decentralised energy model, and if so, which powers. For example, would Welsh Government require more powers over energy conservation, transmission, distribution and supply, which all sit outside of the current competence of the National Assembly for Wales, or could better intergovernmental relations between Cardiff Bay and Westminster suffice?

• Looking to other countries and coming up with suggestions for solving the trilemma and other constraints identified in previous work packages

**Turning fantasy into reality**

Led by:

A detailed, costed, timed action plan for developing a credible renewable energy programme for Wales based on the outcomes of the work packages. The IWA will also develop an influencing and communications strategy alongside the project to ensure the outcomes from the work packages are fed into the political parties ahead of the 2021 Assembly elections.