

## Introduction

At present small wind projects are proposed and funded in a piecemeal fashion, this project aims to establish a methodology for global market assessments, highlighting which regions in particular are suitable for the implementation of small wind. The market assessment identifies which countries are favourable, but also the reasons for their desirability.

This information can be used to direct capacity building or advocacy efforts in order to increase the suitability of a given country. The project has been carried out by the Market Assessment Working Group, with members from the Universities of Strathclyde and Loughborough, and I Love Windpower.

## About Wind Empowerment

Wind Empowerment (WE) is a CIO, registered with the charity commission of England and Wales. WE aims to promote and employ locally manufactured small wind turbines in the developing world as a means of poverty reduction. WE also functions as a network for academics and practitioners to discuss and collaborate on small wind/rural electrification projects.

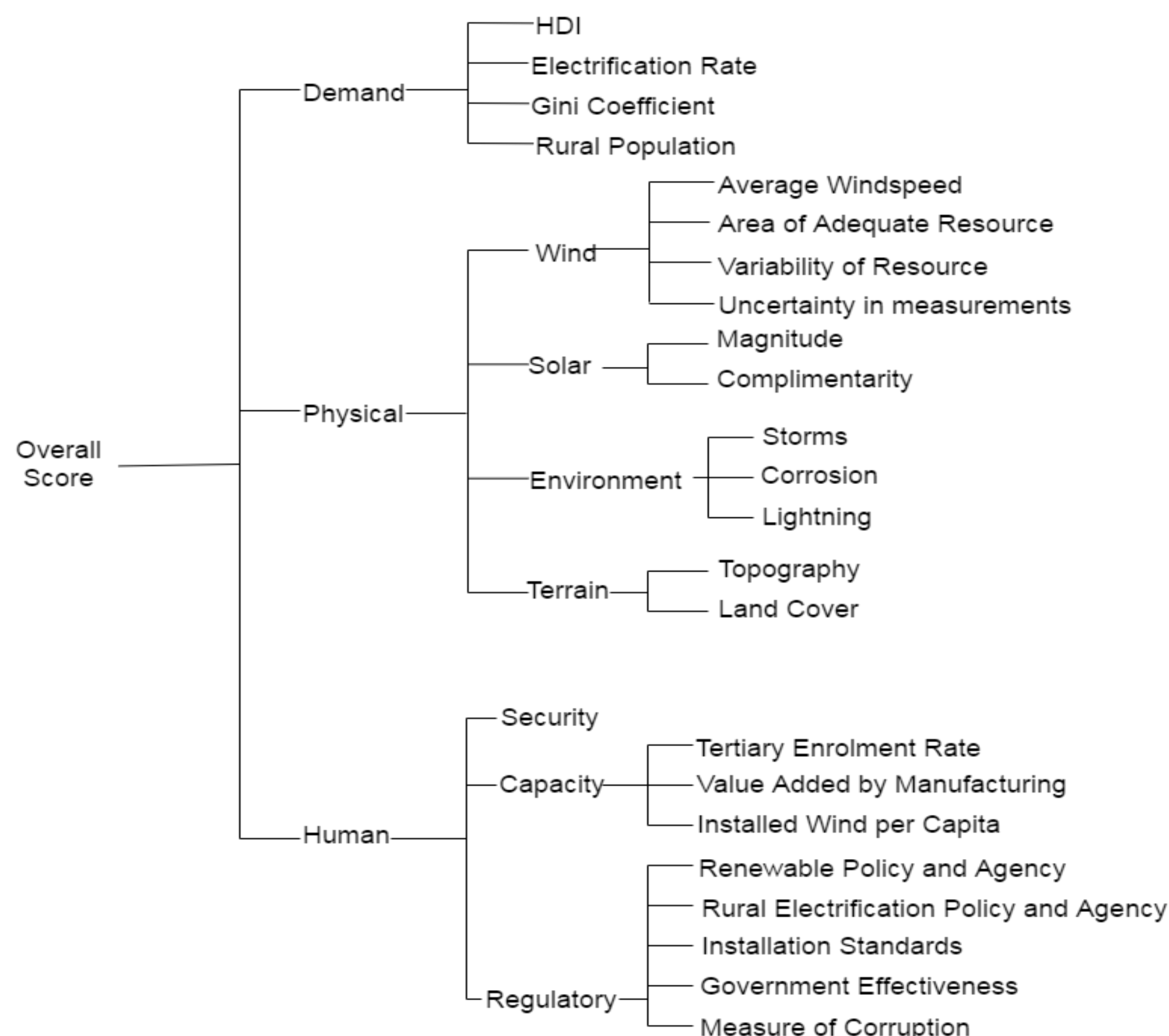
The association has an international membership of academics, NGO's, small businesses and interested individuals. WE has worked on projects in Nicaragua, Peru, Ethiopia and Malawi, with active members in many other countries. To showcase our work and share ideas we host a conference every two years, with previous conferences in Senegal, Greece and Argentina.

Below: Some of the attendees at the Argentine Conference



## Methodology

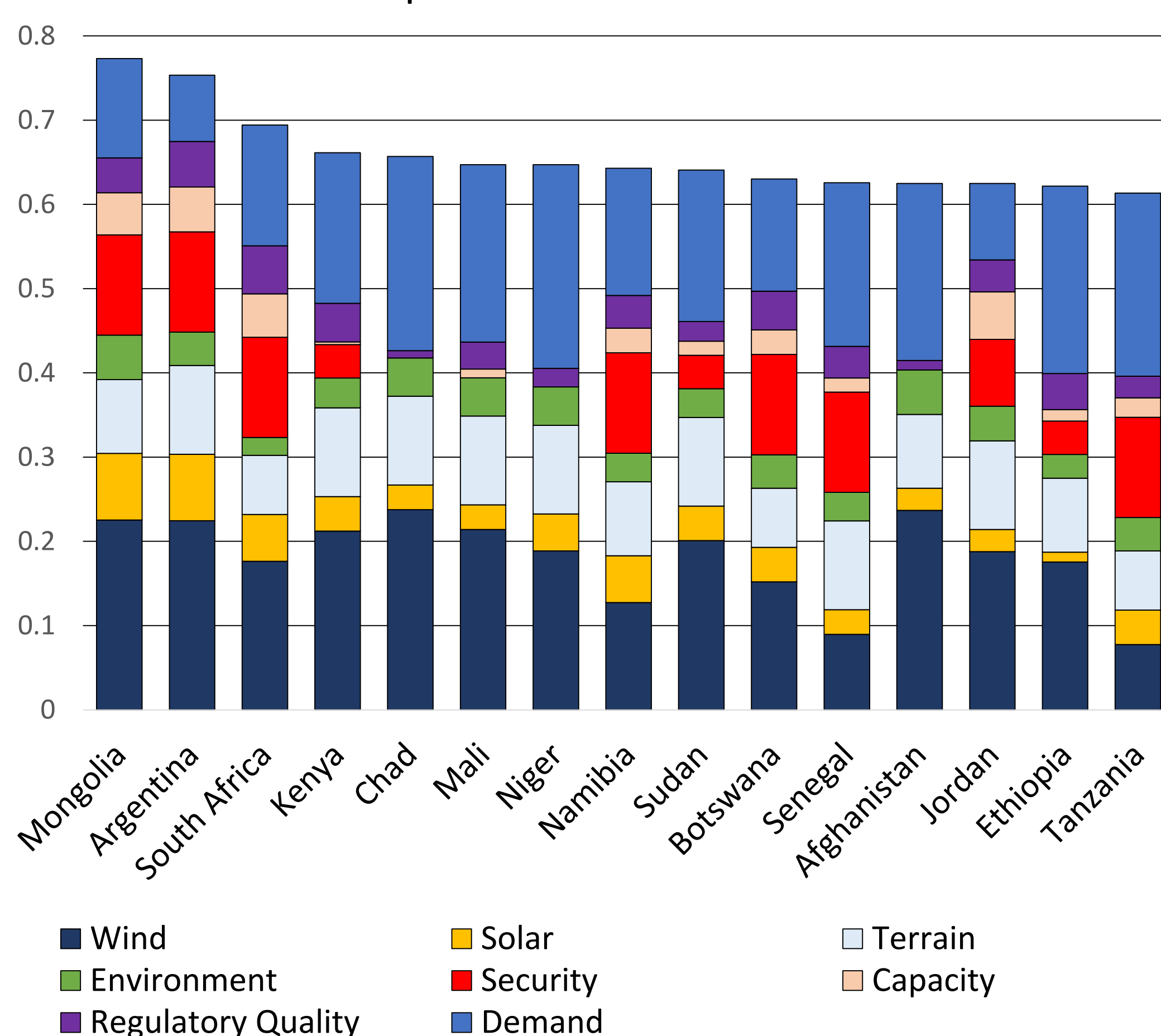
- Countries with high income levels, high electrification rates or low average wind-speeds disqualified from consideration.
- Factors (or 'Indicators') for successful projects identified.
- Data sources for all indicators collected.
- Each indicator scored from 0-3 for every country based on strict criteria developed by the group.
- Missing data was imputed by K-Nearest Neighbour methods as complete data is required.
- Indicators structured into a tree and weighted with Simple Multi-Attribute Ranking Technique (SMART).



## Results

The main result of this project is the generation of a ranked list of countries most favourable for the implementation of small wind turbines. Below is the bar graph produced for the country scores for the top 15 ranking countries, with breakdown by category. Island nations are omitted here, as it was decided that due to unique conditions found on most islands a separate assessment is required to consider small island states.

Top 15 Ranked Countries



## Conclusion & Evaluation

Perhaps the most challenging part of the study was in deciding upon the indicator weights, as comparing between different abstract concepts and how desirable a certain score would be. Clearly this is also the most subjective aspect of the study, and requires further sensitivity analysis in order for the results to be validated.

The study has succeeded in producing a list of most desirable countries for the establishment of small wind turbines for rural electrification, and in producing an intuitive methodology used to achieve this end.

A replication of this study in Geographic Information Software (GIS) is in progress in order to make use of geospatial data (distance to grid, population distribution

etc.) which will be incorporated as additional indicators as in the value tree displayed above.

The next steps for Wind Empowerment should be to perform national scale market assessments in the top ranking countries shown in these results, in order to find the most suitable regions within the country for small wind, and following this, a regional assessment to locate communities that would be appropriate for installing pilot systems within.

Pilot systems will be installed, monitored and evaluated, with the successes and shortcomings recorded in order to inform future initiatives and provide feedback to the market assessment process for further fine tuning.