



**European Cooperation
in the field of Scientific
and Technical Research
- COST -**

Brussels, 15 May 2014

COST 058/14

MEMORANDUM OF UNDERSTANDING

Subject : Memorandum of Understanding for the implementation of a European Concerted Research Action designated as COST Action TU1401: Renewable energy and landscape quality (RELY)

Delegations will find attached the Memorandum of Understanding for COST Action TU1401 as approved by the COST Committee of Senior Officials (CSO) at its 190th meeting on 14 May 2014.

MEMORANDUM OF UNDERSTANDING
For the implementation of a European Concerted Research Action designated as
COST Action TU1401
RENEWABLE ENERGY AND LANDSCAPE QUALITY (RELY)

The Parties to this Memorandum of Understanding, declaring their common intention to participate in the concerted Action referred to above and described in the technical Annex to the Memorandum, have reached the following understanding:

1. The Action will be carried out in accordance with the provisions of document COST 4114/13 “COST Action Management” and document COST 4112/13 “Rules for Participation in and Implementation of COST Activities” , or in any new document amending or replacing them, the contents of which the Parties are fully aware of.
2. The main objective of the Action is to develop a better understanding of how European landscape protection/management and renewable energy deployment can be reconciled to contribute socio-environmentally to the sustainable transformation of energy systems.
3. The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at EUR 52 million in 2014 prices.
4. The Memorandum of Understanding will take effect on being accepted by at least five Parties.
5. The Memorandum of Understanding will remain in force for a period of 4 years, calculated from the date of the first meeting of the Management Committee, unless the duration of the Action is modified according to the provisions of section 2. *Changes to a COST Action* in the document COST 4114/13.

A. ABSTRACT AND KEYWORDS

In response to climate change, limited fossil fuels, and rising energy demand and prices, renewable energy is heavily promoted throughout Europe. While objectives to boost renewable energy and trans-European energy networks are ambitious, it is increasingly understood that public acceptance becomes a constraining factor, and general support for green energy does not always translate into local support for specific projects. Perceived landscape change and loss of landscape quality have featured heavily in opposition campaigns in many European countries, even though renewable energy can facilitate sustainable development, especially in disadvantaged regions rich in wind, water, biomass, geothermal or solar energy.

This Action investigates the inter-relationships between renewable energy production and landscape quality, and the role of public participation for the acceptance of renewable energy systems. The Action will develop a better understanding of how landscape protection and management, and renewable energy deployment can be reconciled to contribute socio-environmentally to the sustainable transformation of energy systems. This Action will consolidate and extend knowledge from a pan-European perspective using a modular methodological framework. This Action will enhance the science base for decision-making, and develop guidelines for public participation in planning renewable energy systems. The potential of sustainable landscape development, with innovative land uses producing synergies for landscape quality and renewable energy, will be revealed.

Keywords: renewable energy; landscape qualities and functions; public participation in planning; energy landscapes; sustainable management of multifunctional landscapes

B. BACKGROUND

B.1 General background

In response to climate change, limited fossil fuels, and rising energy demand/prices, renewable energy is heavily promoted throughout Europe (e.g. Renewable Energy Directives 2001/77/EC and 2009/28/EC). Current European Union targets for energy efficiency and renewable energy sources are to reduce greenhouse gas emissions by 80% by 2050, with the consumption of primary energy reduced by 20% by 2020, by when renewable energy sources should increase to 20% of final energy consumption. While there are ambitious objectives to boost renewable energy and Trans-European energy networks (cf. Strategic Energy Technology Plan-SET Plan), it is increasingly

understood that public acceptance is frequently a constraining factor, and that widespread general support for green energy does not always translate into local support for specific projects (cf. e.g. West et al. 2010). Perceived landscape change and loss of landscape quality have featured heavily in the concerns raised by members of the public, even though renewable energy may offer potentials for sustainable development, especially in economically disadvantaged regions rich in wind, water, biomass, geothermal or solar energy.

Climate change mitigation and adaptation is a major societal challenge and renewable energy is a core element in the transition to a low carbon society. This process will reshape our landscapes. It is unlikely that existing landscape management mechanisms will be effective in adapting to climate change and facilitating renewable energy development. New deliberative, interdisciplinary and integrated approaches are needed to inform and guide the transformation process and to create a vision and coalition for reconciling renewable energy systems and landscape quality across publics, stakeholders, and sectoral, administrative and national boundaries.

COST is the ideal funding scheme: Cooperation and exchange (including STSM) is crucial for the meta-analysis research framework. COST allows a greater variety of members than the EU's Framework Program, and the synthesis of a common European approach based on the participants' research. It is intended that the Action triggers future collaborations, e.g. joint research proposals at European level, and leverages proposals at national levels. COST helps to overcome fragmented national and sectoral research, language and cultural barriers. The empirical approach is supported as a valuable input to both science and practical decision making. This Action consolidates existing research networks across the science/social science/engineering divide, thereby creating a network of networks.

B.2 Current state of knowledge

Research from across Europe has shown that most people are in favour of renewable energy (RE) in principle (e.g. see UK Department of Energy and Climate Change tracking surveys, November 2013), but that proposed developments can often still face significant local opposition, with "landscape" being raised time and again as the key concern (ESF funded workshop "Landscapes of Energies" 2008, yielding special issues in Land Use Policy & Landscape Research 2010). Successful local opposition has resulted in high rejection rates of proposed RE projects in a number of EU countries (reaching 40-90% in parts of the UK, NL, CZ), significantly curtailing the growth of the RE sector.

Whilst "siting controversies" have become a widespread and widely studied phenomenon in

affluent democracies since the 1960s, these have largely been restricted to built-up areas (see special issue in *Journal of Risk Research* 2004) or punctiform issues. Being located in rural areas and having a large spatial footprint, renewable energy technologies have become the focal point of a new type of siting controversy that raises questions about the nature and function of the surrounding landscape. Established academic understanding of siting controversies (e.g. relating to questions of distributional and procedural justice) has not been translated into operational understanding and mechanisms which resolve the growing number of energy-landscape conflicts (e.g. relating to onshore wind farms, bioenergy systems) (e.g. Viardot, 2013), and is little tested in areas of rapidly expanding renewable energies (e.g. solar, offshore wind, tidal and wave facilities) (Zöllner et al. 2008, Wüstenhagen et al. 2007).

The continued expansion of the renewable energy sector means that facilities are growing in size (bigger solar farms, more fields of energy crops, taller wind turbines [esp. after “repowering”]) or number (e.g. increase in small-scale wind, solar, and micro-hydro schemes), and the “easy” locations have already been utilised, causing new developments to encroach on more densely populated areas, and more highly valued landscapes. As a result, controversies and rejected projects are now becoming more widespread in countries which previously led the way in the (largely popular) uptake of renewable energy (e.g. D, DK, ES). This increases the urgency of resolving important questions about public support and landscape capacity, both of which are complex and dynamic and intertwined with each other. While there has been extensive research in some countries into these questions [e.g. on the rejection of simplistic “NIMBY” (not in my backyard) explanations (e.g. Devine-Wright and Howes 2010), on the importance of deliberative landscape planning (e.g. Buchecker et al. 2010), on technological advances in landscape visualisation (e.g. Chias and Abad 2013)], so far there has been very little integration, synthesis, and cross-national policy learning from the full range of RE technologies and across disciplinary boundaries.

B.3 Reasons for the Action

With the continued roll-out of renewable energy technologies to meet EU targets on low carbon energy, and the widespread recognition of the value of European landscapes to people’s wellbeing and the rural economy, the pressures on decision-makers (e.g. planners, public agencies), communities, and developers to resolve landscape-energy conflicts is increasing.

Experts of siting controversies and public engagement with energy technologies are recognizing the relevance of landscape, but are rarely equipped to examine the complexities at the interface between RE technologies and landscape. On the other hand, experts in landscape planning and perception

have been examining renewable energy technologies as new landscape elements (e.g. through 3D visualizations), but they have largely done so without an in-depth understanding of the nature and origins of siting controversies. Without a stronger collaboration and integration of their respective expertise, as envisaged in this Action, neither group will be able to provide the kind of advice that can help break the deadlock in landscape-energy conflicts. Therefore, societal, economic and technological benefits, and an increased risk of disbenefits, from renewable energy developments are constrained by a lack of advice relevant to the range of biophysical and socio-economic conditions in Europe.

There is a need to synthesize research and practice-based knowledge from across national and disciplinary boundaries to develop a better understanding of how to reconcile the policy agendas of renewable energy development and landscape conservation in the coming decades, against a dynamic backdrop of large scale investments in (low carbon) energy technologies, persistent Arcadian ideals of rural landscapes, ongoing rural change, growing demands on rural land and the need for greater climate resilience and energy security. This understanding (see main aim of the Action, C.1) can only be pursued through extensive and structured dialogue across a European network of academics and practitioners, to share expertise and develop tools and advice for conflict mitigation and resolution. These outputs will become productive outcomes through active engagement with practitioners and stakeholders throughout the course of this project, and through early and explicit targeting of relevant audiences for dissemination.

This Action thus seeks to address both European economic/societal needs and scientific/technological advances; which will be reconciled within this Action.

B.4 Complementarity with other research programmes

The EU's FP7 paves the way for implementing the Strategic Energy Technology Plan (SET Plan): € 2.35 bn are dedicated to non-nuclear energy research focussing on sustainable energy production from a technological perspective. Although more than 30 socio-economic energy projects have been funded in the FP (such as CREATE ACCEPTANCE, ACCSEPT, LETIT, FET-EEU, CEERES) much previous research has been relatively restricted in terms of its geographical scope or its isolated sectoral reach. Research aimed at understanding the impacts of renewable energy technologies on perceived landscape quality and thus their social acceptance on a European scale is limited and validation is lacking, yet time is pressing to meet renewable energy goals.

The Action will complement some existing EU projects, such as the EU Life Long Learning Programme funded E-CLIC (understanding the European Landscape Convention using ICT tools,

with renewable energy as one topics being addressed). It will be informed by projects such as the FP7 KBBE FarmPath on land manager behaviours, with case studies on the uptake of wind energy and consequent impacts on agricultural landscapes.

On a national level, many emerging research programmes on renewable energy exist, e.g. in October 2013, the Swiss National Fund launched two calls focusing on the supply (NRP 70) and on the demand side of the energy turnaround that is envisioned in the “Swiss Energy Strategy 2050”. In both calls, however, landscape aspects have not been addressed, although landscape impacts are widely considered a main limitation of the expansion of renewable energy production.

Consequently, the Action can build on a variety of European and national, ongoing and completed research projects that have touched the problem of renewable energy production systems, landscape quality and public acceptance from one or the other end, while bringing all those three aspects together from a pan-European perspective. The Action will be ideal for consolidating and complementing existing research, and for generating a multi-, inter- and transdisciplinary science-base for practically applicable guidelines and toolkits that otherwise could not be created.

The issues addressed by the Action presents no duplication to existing research in other European frameworks.

C. OBJECTIVES AND BENEFITS

C.1 Aim

The main objective of the Action is to develop a better understanding of how European landscape protection/management and renewable energy deployment can be reconciled to contribute socio-environmentally to the sustainable transformation of energy systems. This will be undertaken by consolidating and extending knowledge from the fields of landscape quality, renewable energy, and public participation from a pan-European perspective. This Action will provide a science base and empirically-based knowledge of best practice for decision-making, and produce guidelines and toolboxes for public participation in the planning of renewable energy systems. It will reveal the potential of sustainable landscape development, with innovative land uses producing synergies for landscape quality and renewable energy. This Action will help to optimise trade-offs between renewable energy production and landscape protection by promoting an effective renewable energy policy without jeopardising the values and quality of European landscapes. It will advance participative approaches in planning to assist a smoother transition to energy systems based on renewable energy.

C.2 Objectives

Following the European Landscape Convention and the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, this Action will address four secondary objectives:

1. advance a transdisciplinary and multi-paradigm science base to aid in the management of landscapes, in the light of climate change and renewable energy deployment;
2. examine, critique and (re)define landscape quality objectives in the context of the above-mentioned challenges, based on validated empirical research;
3. increase the awareness of the two-way interaction between renewable energy systems and landscape quality;
4. explore and extend procedures for participation of the public and other parties in the planning of renewable energy systems.

To achieve the overall aim and the above stated secondary objectives, the Action will guarantee the exchange and transfer of knowledge in several ways:

- International knowledge transfer: Experts from the countries involved will bring together national perspectives to the topic of renewable energies and landscape quality as well as specific national approaches to planning and public participation, based on their specific legal, cultural, natural and economic background.
- Interdisciplinary knowledge transfer: Participants from different disciplines and sectors involved (landscape sciences and planning, renewable energy technologies and economics, public participation and governance) will contribute disciplinary/sectoral perspectives to develop a holistic view and approach to the reconciliation of European landscape protection/management and renewable energy deployment.
- Knowledge-transfer from science to practice and *vice versa*: Academics and practitioners will apply different theory- and practice-focused views and approaches to the development of renewable energy production systems and high quality landscapes.
- Knowledge-transfer from professionals to the public and *vice versa*: By providing the public with findings compiled within the Action and at the same time taking the

public's view, values, attitudes and needs into account as an empirical basis for applied research, a process for developing mutual benefits will be established.

The following tangible products of the Action will be provided within the duration of the Action and will be published in specific media (e.g. Internet, journal, book), format (e.g. simplified and more illustrated formats targeting practice and public) and languages to reach the relevant target audiences (cf. C.5).

1. A systematic review of the nexus between renewable energy systems and Europe's landscapes as living, economic, ecological, social, cultural and recreation spaces, and their importance in relation to people's heritage and basis for identification.
2. A pan-European documentation and synopsis of landscape quality and character assessment.
3. A typology of best practices of sustainable, landscape compatible renewable energy production systems.
4. A guideline to assess potential areas for specific renewable energy systems in terms of effects on landscape quality/character, suitable for EIA, SEA and other planning instruments, taking into account the Commission's proposal for EIA directive revision.
5. A catalogue of relevant criteria, indicators and respective GIS-available proxy-data for assessing the suitability of landscapes for renewable energy systems; possibly leading to maps of synergies/conflicts between landscape quality and renewable energy systems using European databases.
6. A toolbox for landscape-aware public participation in all stages of planning for renewable energy.
7. A multilingual glossary for scientific collaboration and trans-border public participation.

The set of dissemination activities will ensure proper distribution of all of the Action's findings to the target groups (cf. C.5): Action web page, interactive internet data-bases, guidelines, scientific articles (peer-reviewed), practice-oriented articles (editorially approved), scientific and stakeholder workshops and meetings, conferences, Short Term Scientific Missions, and a comprehensive book.

C.3 How networking within the Action will yield the objectives?

The objective of the Action is to develop a pan-European perspective for the socio-environmentally

sustainable transformation of energy systems, and to disseminate this perspective to the target groups listed in section C.5. To do so, Action gathers a network of researchers with broad expertise in different aspects of landscape, public participation, energy and planning research from 13 countries from all the major geographical regions of Europe, and from North America. The Action guarantees a representative pan-European perspective by gathering participants from southern/Mediterranean parts of Europe, alpine Europe, north-western Europe and central Europe. The multi-level knowledge transfer (cf. C.2) can only be achieved in a concerted Action as made possible by the COST framework. Simultaneous Working Group meetings twice a year will be focal points of collaboration and ensure coordination and continuity of the work within the Action. They provide all Action participants with information about the state of work in all other WGs, and serve as milestones for the thematic work within the specific Working Groups.

Continuous exchange of information and discussions among the researchers, for example, by desktop collaboration tools, video-conferencing and through the Action's website (which will contain interactive fora), will enable the Action to produce comprehensive reviews and understanding of the Pan-European situation and challenges. At the same time, appropriate regional interest groups on, for example, particular types of renewable energy production will be established. A special focus will be put on activities for Early Stage Researchers to provide the opportunity to work with full dedication on specific aspects of landscape quality and the development of renewable energy production systems, and to exchange and discuss their ideas and findings with experienced experts.

C.4 Potential impact of the Action

This Action will have substantial impact on three levels:

1. It will promote and integrate the so far rather fragmented research on the interaction between landscape and renewable energy. This will mainly take place by synthesizing and extending findings of different basic and applied research fields from a pan-European perspective and making them available for project planning. The transdisciplinary knowledge base will provide new impetus to integrated landscape and energy research, suggest new approaches (such as landscape vulnerability and resilience, social impact analysis) with the potential to change planning paradigms, procedures and practices for public participation. By bringing together leading research teams in the field of landscape character and quality, renewable energy, and public participation, this Action will establish a new network of experts on the societally

highly relevant overlap of these areas and promote the potential of European landscape research for sustainable development.

2. It will contribute to a successful implementation of EU and national policies on the energy turnaround. With public acceptance having a high impact on the realization of renewable energy systems, this Action will in particular provide criteria for the sustainable, landscape-compatible expansion of renewable energy systems (for different energy sources, incl. transmission/storage) as well as guidelines and best practices for an optimal involvement of the affected public in the planning of these systems.
3. Through informing about potential areas of specific renewable energy systems, acceptance promoting factors and benefits of locally supported renewable energy projects, this Action will furthermore have a motivating impact on stakeholders involved in energy initiatives (e.g. energy regions, energy cities) and energy enterprises to start locally adapted renewable energy projects. An important impact of the Action will also be applied pilot projects that result from the network of experts from research, practice, governmental and non-governmental institutions newly established by the Action.

C.5 Target groups/end users

The Action aims at providing results to at least five different groups of end users.

Policy-makers at EU and national level: A means of increasing the level and quality of public participation in landscape planning is to embed procedures in legislation, such as national Planning and Building Acts, and encourage internationally accepted best practice. The multilingual glossary and inventory of best practices will be the central to the delivery and design of effective policies for renewable energy planning.

Decision-makers in public agencies and business: It is important to provide public servants at international to local level, and also private consultants or developers, with information and tools that ensure smooth and effective planning processes for renewable energy, recognising that co-development of renewable energy plans by these actors in the planning process could significantly aid delivery of COST objectives. The guidelines on how to assess potential areas for development will be of particular significance in this respect.

Energy, landscape, agricultural, urban and regional planners: It is of crucial importance to consider issues of landscape quality and public participation already at the planning stage. Spatial

planning has particular significance in the delivery of pan-European approaches, associated documentation, and a synopsis of landscape quality and character assessment, and in the toolbox for public participation. This Action will link with initiatives such as the “Renewable Grid Initiative” a consortium mainly consisting of Transmission System Operators (TSOs) from various European Countries and provide input to their strategic and participatory planning of the future grid.

General public: It is a general principle of the European Landscape Convention, and general provision of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, that the public are entitled to environmental information to inform participation in decision making processes. Improved information on processes and principles through Web-based empirical research and the web-based dissemination of the Action’s activities and results will be directed towards the general public.

NGOs: Non-governmental organisations play an important role in influencing public opinion, managing land, and in “anchoring” procedures and concrete projects among the general public. They are significant actors in public hearings, and land owners or managers which have to balance competing demands for sustainable development, often facing difficult decisions to balance apparently incompatible objectives.

D. SCIENTIFIC PROGRAMME

D.1 Scientific focus

The Action will develop a specifically pan-European approach integrating disciplinary, sectoral, national and regional perspectives, as well as academic and practical viewpoints. By pooling the existing knowledge of leading national research teams in the fields of landscape quality and landscape planning, renewable energy production systems, and public participation and governance, a foundation will be built for a deeper understanding of the multidisciplinary issues involved in successfully achieving the envisaged transition towards renewable energy production systems. To stimulate the knowledge pooling and exchange, a systematic review and subsequent meta-analysis will be used.

At the same time, research will be grounded in current practices and in problems of particular national planning projects and the Action members’ individual nationally funded research projects, using strategic case studies to guarantee the compatibility of this Action’s findings and products with the future implementation.

Innovation and the generation of new, deliberate assessment methods for the interplay of landscape quality and renewable energy production, as well as new procedures for public participation in the

planning of renewable energy production systems will be approached by analysing best practices and developing typologies and frameworks. These will be based on multidimensional scenario techniques including the potential of digital media for data acquisition, visualization and participation.

The structured, yet flexible scientific work plan (D.2) will act as a framework for all of the Action's activities and ensure the multi-level knowledge transfer (C.2), as well as the successful delivery of the products and outcomes (C.2).

The Action's approach will tie into the widely introduced assessment framework of Ecosystem Services (ESS) and will adapt it for the planning of renewable energy production systems. In particular, the Action will complement the biotic and abiotic ESS by providing applicable approaches to including the cultural Ecosystem Services ("nonmaterial benefits people obtain from ecosystems [and/or landscapes] through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences").

D.2 Scientific work plan methods and means

The three main research approaches mentioned in section D.1 will be applied within the Action by four Working Groups (WG) (cf. E.2) as described in the following:

Systematic review and meta-analysis

The systematic review and meta-analysis of empirical research findings on landscape quality change through renewable energy development will be conducted by WG 1. This Working Group will focus on specific renewable energy production systems (e.g. wind, solar, biomass, hydro, and geothermal energy) and their impacts on landscape quality in Europe. Past, present and scenarios of future situation(s) will act as guidelines for this process. Empirical data and findings from members' research projects and practical planning projects will be pooled according to a flexible framework, which allows the inclusion of new participants in this Action. By analysing this newly generated, extensive, international and interdisciplinary data base and knowledge pool, a new level of understanding can be generated according to the dictum "The whole is more than the sum of its parts".

The general question of landscape change and landscape dynamics has to be taken into account, to allow the research approach to provide "future-proof" findings. By providing a systematic review of the nexus between renewable energy production systems and Europe's landscapes as living, economic, ecological, social, cultural and recreation spaces, as cultural heritage and as a basis for identification, and by providing a pan-European documentation and synopsis of landscape quality

and character assessment methods, WG 1 will provide a solid foundation for the work of WG 2, WG3, and WG 4.

Strategic case studies

WG 2 will conduct an analysis of risks and potentials for landscape functions and qualities affected by renewable energies, and an analysis of the specific landscape functions' and qualities' vulnerability to specific renewable energy production systems. As a basis for the development and later validation of the participation toolkit (WG 3), strategic case studies in nationally funded projects will be used, with external observation, analysis and documentation and charrette-like participation workshops. An iterative, two-way exchange of information between the Action and the national projects will allow for a flexible adjustment to external preconditions and new Action members during the entire Action.

Based on the work of WG 2, a typology of best practices of sustainable, landscape compatible renewable energy production systems will be developed. Taking into account the theoretical and empirical findings of WG 1 and the case-study based findings of WG 2, a guideline will be developed for the assessment of potential areas for specific renewable energy systems in terms of effects on landscape quality and/or character. Taking into account current policy developments such as the European Commission's proposal for the revisions of the Environmental Impact Assessment (EIA) Directive, the suitability for EIA, Strategic Environmental Assessment (SEA) and other planning instruments, commonly used in European Union countries will be the focus of this research activity.

In addition to the guideline mentioned above, a catalogue of relevant criteria and indicators and associated GIS-data for assessing the suitability of landscapes for renewable energy systems will be compiled. This catalogue can be used to generate maps of synergies/conflicts between landscape quality and renewable energy systems using European databases. To demonstrate the applicability of the catalogue, Early Stage Researchers (ESR) will produce an example of such a map in a summer Training School in one of the case study areas.

Multidimensional scenario techniques

Based on the work of WG 1 and WG 2, and an inventory of best practice examples of participatory renewable energy projects in all partner countries conducted at the beginning of the WG 3 activity, multidimensional scenario techniques will be used to enable the Action to account for multiple conditions in an uncertain future, and the context of different countries', cultures' and energy systems', when developing the toolbox for landscape-aware public participation in all stages of planning for renewable energy production systems. This toolkit will support the inclusion of socio-cultural aspects of sustainable renewable energy production in planning procedures, and the

integration of renewable energy in existing participation toolkits will be stipulated.

To generate the scenarios as a basis for the toolkit, and to consolidate, and cross-validate findings of the meta-analysis (WG 1) and case-study approach (WG 2), advanced GIS-based 3D-visualizations of the scenarios will be used in empirical studies carried out by the participants, allowing for cross-cultural comparison of reaction to these scenarios. Validated means of data acquisition using new technologies (WWW, GPS, smartphones, tablets, participatory GIS and social media applications) will complement traditional means of direct and indirect, qualitative and quantitative data collection. Therefore, there will be a participatory (i.e. democratic) approach already in the generation of the participation toolkit. The work of WG 3 will include issues such as economic and community benefits possibly generated by renewable energy production systems. The question not only of the public acceptance of renewable energy production systems in the landscape but also the public acceptance of the experts' assessment and determination of the location, implementation and aesthetic representation of the specific renewable energy production system will also be incorporated in WG 3. This will allow for a much wider and deeper understanding of how to mitigate potential conflicts between landscape quality and renewable energy production systems and factors which influence the public acceptance of renewable energy production systems from a pan-European perspective.

Planners of renewable energy production systems, administrative staff and consultancies in spatial planning, and NGOs, will be included in this activity to ensure that the resulting toolkit is of maximum value for current and future planning practice.

Synthesis of findings and dissemination

WG 4 will synthesize findings and then disseminate results (cf. section H) to the specific target groups (C.5). WG 4 will commence work at the start of the Action and will interact with all other WGs to establish and constantly maintain a multilingual glossary for scientific collaboration and trans-border public participation. The glossary will be based on existing glossaries, such as the EUCALAND glossary (on landscape quality) and the COMMUN glossary (on spatial planning). It will include and extend existing glossaries on renewable energy production systems and provide a basis for collaboration across multiple disciplines, nationalities and knowledge levels (experts vs. public). The glossary will not only consist of translations, but also of definition from specific national and disciplinary perspectives, which is especially important for the topic of landscape qualities, where different disciplines merge, as well as for the transfer of knowledge between the sectors involved (e.g. landscape planning, energy production, participation/governance).

WG 4 will also be responsible for setting up and maintaining the Action's website (cf. sections E.1 and H). The website will provide content and interactive functionality, such as a wiki (similar in

functionality to Wikipedia) to allow the Action members to work interactively on the glossary and their respective WG tasks. It will also provide a forum for a constant moderated dialogue between the Action and the general public, and external NGOs. In this respect, the work of WG 4 goes far beyond the mere dissemination/publication of the Action's results, but provides a valuable input to research by preparing and providing communication channels for synchronous and asynchronous dialogue between various partners within this Action and external partners.

E. ORGANISATION

E.1 Coordination and organisation

The Action has been initiated by a network of researchers from 13 COST countries and encourages additional individual researchers and COST countries to join. The coordination of the Action is overseen by a Management Committee (MC), according to the COST regulations.

The task of the MC will be to review the direction and progress of the work plan including the dissemination of the outputs elaborated. The MC will also initiate and maintain an ongoing exchange of information with relevant key international bodies.

Each of the Working Groups (WG) will have a designated WG leader. Together with the Chair and the Vice-Chair of the Action, the WG Lead Partners will form a Steering Group (SG) as a managing board of the Action. The SG is in charge of maintaining communication between Action participants, the coordination of the Working Groups and the preparation of the Management Committee meetings. Furthermore, the SG is responsible for controlling and evaluating the implementation of the Action together with the MC. On the agenda of each MC and SG meeting, the evaluation and monitoring of the planned, ongoing and completed activities will be a set agenda item. The deliverables of the WGs will be monitored by the SG, which will undertake the relevant quality control prior to publishing the results of the Action in the appropriate formats and media (cf. dissemination plan, section H).

Major Action meetings will be arranged twice a year, each lasting for two to three days. These Action meetings will include the respective WG meetings, MC meetings, SG meetings, opening and closing plenary sessions for all Action participants and short field trips. The meetings will be held in or in close proximity to the selected case-study areas.

By locating the Action meetings close to the case-study areas, practitioners, regional/local NGOs and administrative bodies can be included in the programme of meetings without incurring additional travel (cost) and at the same time reducing risks of a lack of engagement due to time constraints or regulatory issues. This will enable a direct two-way dialogue between researchers and

practitioners, provide a valuable input to the research process, and also enable the constant monitoring of the Action's progress and potential for the practical applications of the Action's results.

The Action will be especially open to representatives of the sectors of renewable energy technology and renewable energy economy and the initial participants will actively seek contact with those sectors and invite representatives to join meetings and workshops where suitable or the entire Action if possible. Membership of relevant trade and sectoral groups will be exploited.

Two Action conferences, which will include workshops focusing on key challenges, demonstrations of tools and feedback sessions (depending upon the stage of the Action), will be milestones in the Action: The first conference/workshop will address the needs for knowledge, guidelines, toolkits, etc. at the outset of the Action. A second conference/workshop will be used to share the results and to collect feedback from practitioners from the different target audiences, on products towards the end of the Action, with sufficient time to allow for the inclusion of this feedback in the final publications.

To guarantee the coordination of national research, which is a necessary precondition of the Action's successful implementation, there will be a set of activities run with common aims, protocols and standards. These will include shared surveys with standardized items, standardized inventories of good practice, norms and meta-data of GIS data layers of relevance to renewable energy. Examples include data relating to potential for production, such as wind speed, soil type, solar illumination; data on constraints for development – e.g. Natura 2000 sites; representations of renewable energy types, such as a library of 3D models of wind turbine and solar farm designs. A shared project will also be run on energy-sensitive landscape elements.

Short Term Scientific Missions (STSM) with a focus on the involvement of Early Stage Researchers (ESR) will increase the extent of knowledge exchange between the national projects. The Action website will provide the central platform for information, collaboration, and dissemination and enable cooperation between the Action participants between the respective workshops and meetings. The Action website will be set up shortly after the start of the Action, hosted by the organisation of the Action Chair. As the website will consist of static and interactive content, a system will be chosen, which allows the Action members to update material themselves and will allow various levels of interaction between different groups within the Action, and with external partners and the general public. For details regarding the role of the Action website in terms of the scientific work plan see section D.2, regarding the Action's website's role for the dissemination plan see section H.3.

Key milestones will be:

- Annual Action reports which combine the finding of all WGs
- First Action conference, month 9
- Action Training Schools in year 2 (focus on WG 1 and 2) and in year 3 (focus on WG 3)
- Final Action conference, month 42
- Final Action report at month 48
- Action book at month 48

E.2 Working Groups

There will be four interacting Working Groups (WG) addressing different scientific methods, as explained in chapters D.1 and D.2: Three topic-focused WGs and one synthesis and dissemination WG. The WGs will hold two meetings per year presided by a WG Chair leading the respective WG. The WG chair will be assisted by a WG Secretary. First milestones of the WGs have been defined in the timetable (cf. F.) and can be adjusted by the WGs following the work plan they will set up at their first meeting.

The detailed scientific focus of and work plan of the four WGs is described in section D.2.

WG 1 will review specific renewable energy production systems and their impacts on landscape character and quality in Europe from a past, present and future perspective (e.g. considering scenarios), and produce a systematic review of the nexus between renewable energy systems and Europe's landscapes' qualities, and documentation and a synopsis of landscape quality and character assessment. WG 1 will begin at the outset of the Action and operate for approximately 1.5 years, after which a report will be produced and an interactive workshop held. WG 1 will continue for another 1.5 years, but at a lower level of activity, to track new developments (e.g. evolving technologies, uptake in different areas of Europe) and produce dissemination products on the WG outcomes (review papers, internet data-base).

WG 2 will assess landscape functions/qualities and their sensitivity to/potential for specific renewable energy production systems. This analysis of potential and risk will be used to produce: (i) a typology of best practices of sustainable, landscape compatible renewable energy production systems, (ii) guidance for assessing the potential of areas for specific renewable energy systems in terms of effects on landscape quality/character, (iii) a catalogue of relevant criteria, indicators and respective GIS-available proxy-data for assessing the suitability of landscapes for renewable energy

systems. WG 2 will begin at the outset of the Action for approximately 2 years, after which a report will be produced and an interactive workshop held. WG2 will continue for another year, but at a lower level of activity, in order to track new developments (e.g. datasets from national agencies on landscape character or qualities) and produce dissemination products on the WG outcomes (guidelines, catalogue of GIS-datasets).

WG 3 will investigate socio-cultural aspects of sustainable renewable energy production and propose modes and means of integrating specific aspects of renewable energy in participatory toolkits. WG 3 will begin at the outset of the Action for approximately 1 year, collecting preparatory data and selecting case study regions. After year 1, with substantial inputs from WG 1 and WG 2, the intensive phase of WG 3 will start for two years. The last year will be mainly dedicated to finalizing and disseminating the toolbox for participation. The overlap of the intensive phases of WG 1, WG 2 and WG 3 guarantees the desirable exchange of information but also allows each of the three Working Groups to tailor their work program to fit the demands of the other Working Groups.

WG 4 will focus on the synthesis of findings and dissemination of results. WG 4 will begin at the outset of the Action, and establish the communication structures and dissemination structures including the Action website. In the first year, WG 4 will coordinate the development of a multilingual glossary for scientific collaboration and trans-border public participation as an important prerequisite for the cooperation and exchange of knowledge in all WGs. WG 4 will interact with all other WGs and constantly expand over the course of the Action, with more and more material available for publication and dissemination.

E.3 Liaison and interaction with other research programmes

Section B.4 has described the complementarity of this Action to other completed and ongoing research projects and research frameworks relating to the topic of renewable energy production systems, their landscape impacts and their public acceptance as well as the role public participation plays.

This Action will also establish contact with the following completed or ongoing COST Actions that have a topic relating renewable energy, but which do not take account of issues of landscape quality and public participation/acceptance:

- Action TU1104 Smart Energy Regions (SMART-ER) (2012-2016)

- Action TU1304: Wind energy technology reconsideration to enhance the concept of smart cities (WINERCOST) (2013-2017)

A two-way exchange with those two Actions is envisaged, to get input on the technological side of renewable energy systems, but also to provide input to those two Actions on landscape impacts and public acceptance.

Researchers from the above Actions and the projects mentioned in section B.4 will be invited to contribute to and collaborate with this Action. Specific invitation and presentation opportunities will be given to selected projects for specific Action workshops, meetings and conferences. The interactive parts of the Action's website will link researchers from the Action with scientists from other projects and programs.

The Action will also establish links with relevant national research programmes or activities (e.g. Scottish Government Strategic Research Programme: Energy and Water Theme, and Land Use Theme), and the links with public policy provided by appropriate institutions (e.g. Scottish Government Centre of Expertise on Climate Change: science policy interface).

The Action will also link to other COST Actions and EU Projects that address landscape issues from a non-energy perspective, such as COST Actions IS1204, A27, FP1204 and the EU FP7-Project HERCULES (Sustainable futures for Europe's HERitage in CULTural landscapES). This link with mainly realised by the Action members' involvement in these projects and the direct knowledge transfer by these persons.

E.4 Gender balance and involvement of early-stage researchers

This Action will respect an appropriate gender balance in all its activities and the Management Committee will place this as a standard item on all its MC agendas. The Action will also be committed to considerably involve early-stage researchers. This item will also be placed as a standard item on all MC agendas.

The Action will be conducted by a gender-balanced network of researchers. When setting up the Working Groups and other structures (MC, SG, STSM, Training Schools, etc.) gender balance will also be a standard criterion for their composition and positions of Chair, vice-chair and Secretary. A special emphasis within this Action will be put on the involvement of Early Stage Researchers (ESR), to promote capacity building and personal qualification in relation to renewable energy production systems, landscape quality and public participation/acceptance. Short Term Scientific Missions (STSM) and Training Schools (TS) especially for ESR will contribute to this goal.

The development of activities, products, and dissemination activities will include ESRs and consider gender balance in the relevant teams to take advantage of balance and insights to different topics and target audiences that this may facilitate.

F. TIMETABLE

The duration of the Action is four years (48 months). The Action is structured into 4 main blocks coordinated in the four WGs. All milestones listed in section E.1 are also reflected in the timetable. Two meetings will take place each year. Each meeting will combine a MC meeting and WG workshops to minimise participant travel and cost, and allow for cohesion across the work programme. Annual reports of progress, with a summary of each WG's activities and results, will be produced. The main Action conferences will be in years 1 and 4. In years 2 and 3 there will be Training Schools, particularly targeting Early Stage Researchers. At the end of year 4, a comprehensive book will be published.

	Year							
	1		2		3		4	
Kick-off phase Constitution of Management Committee (MC), Steering Group (SG), Working Groups (WG); Setting up of structures and tools (e.g. interactive Action website)	X							
Working Group 1 Specific renewable energy production systems and impacts on landscape quality in Europe: past, present and future (typologies, criteria)	x	X	X	X	x	x	x	
Working Group 2 Landscape functions/qualities and their sensitivity to/potential for specific renewable energy production systems (risk and potential analysis)	x	X	X	X	X	x	x	
Working Group 3 Socio-cultural aspects of sustainable renewable energy production: Integration of renewable energy in participation toolkits	x	x	x	X	X	X	X	

	Year							
	1		2		3		4	
Working Group 4	x	X	X	X	X	X	X	X
Synthesis of findings and dissemination								
Milestones								
Meetings, incl. kick-off meeting	o	o	o	o	o	o	o	o
Annual progress reports		o		o		o		
Action Conferences		o					o	
Training Schools with special focus on Early Stage Researchers				o		o		
Publication of comprehensive Action book								o
Symbols: x = lower activity level; X = higher activity level; o = milestone with deliverable								

G. ECONOMIC DIMENSION

The following COST countries have actively participated in the preparation of the Action or otherwise indicated their interest: BE, CH, CZ, DE, DK, EE, ES, FI, FR, HU, NO, SE, UK. On the basis of national estimates, the economic dimension of the activities to be carried out under the Action has been estimated at 52 Million € for the total duration of the Action. This estimate is valid under the assumption that all the countries mentioned above but no other countries will participate in the Action. Any departure from this will change the total cost accordingly.

H. DISSEMINATION PLAN

H.1 Who?

The dissemination plan of Action addresses the following five main target groups (for details cf. section C.5): Policy-makers, decision-makers, planners, non-governmental organisations (NGOs), and the general public.

Policy-makers at EU and national levels, drawn from relevant EU DGs (e.g. REGIO, ENERGY, ENV, AGRI), European bodies (e.g. European Environment Agency), and national bodies, will receive a profound science base and empirical (practice-based) knowledge base for embedding procedures of public participation and landscape-sensitive planning for renewable energy systems in legislation, subsidy systems and strategic renewable energy plans.

Decision-makers in public agencies and business in relevant regional and local governments, public agencies (e.g. natural heritage protection, and regulation), and representative business bodies (e.g. European Wind Energy Association) will have typologies of best practices, guidelines for assessment, frameworks and toolboxes to improve actual project planning in terms of public participation and consideration of landscape quality objectives.

Energy, landscape, agricultural, urban and regional planners will benefit from the consolidated and extended knowledge and applicable toolkits for the realisation of the transition towards renewable energy systems.

The general public will profit from documented best practices and toolkits for comprehensive public participation in the planning of renewable energy systems. The general public acts both as a consumer but also as a producer of energy (e.g. photovoltaic installation on rooftops, cooperative wind turbines, etc.).

NGOs with responsibilities for sectoral interests, or communities of interest or place: Non-governmental organisations will be given a knowledge base and tools such as a multilingual glossary to extend their role in formal and informal planning processes.

The dissemination plan of the Action addresses all these target groups not only by the publication of final products and reports but also through the active participation of members of these audiences in the working process of the Action.

In addition to the above-mentioned target groups, scientists from participating and other European countries will be encouraged to further build on the findings of the Action, and academics from other continents can follow the European leadership in terms of landscape-compatible participatory planning for renewable energy production.

H.2 What?

The Action distinguishes between three types of dissemination methods: (I) Fora/interactive platforms are used for direct dissemination and interaction with the target groups (as described in section C.5). (II) Products/deliverables focus more on the content side of dissemination and describe the tangible objectives as listed in section C.2. (III) The publications comprise various formats and media, specifically designed for each type of end user group. The following table shows the linkage between dissemination output and the respective target groups.

	PM	DM	PL	NGO	GP	AC
Fora, interactive platforms						
Multilingual glossary for scientific collaboration and trans-border public participation	X	X	X	X	X	X
Action website: internal discussion forum (password protected)	X	X	X	X		X
Action website: open discussion forum					X	
Action workshops		X	X	X		X
Action conferences	X	X	X	X		X
Teaching: Action members are involved in teaching at undergraduate and postgraduate levels. Findings from the Action will be disseminated in teaching material.			X			X
Training Schools focussing especially at Early Stage Researchers						X
Products/Deliverables						
Systematic review of the nexus between renewable energy systems and Europe's landscapes as living, economic, ecological, social, cultural and recreation spaces, and their importance in relation to people's heritage and basis for identification		X	X	X		X
Pan-European documentation and synopsis of landscape quality and character assessment		X	X			X
Typology of best practices of sustainable, landscape-compatible renewable energy production systems	X	X	X	X	X	X
Guidelines to assess potential areas for specific renewable energy systems in terms of effects on landscape quality/character, suitable for EIA, SEA and other planning instruments	X	X	X	X		X
Catalogue of relevant criteria, indicators and respective GIS-available proxy-data for assessing the suitability of landscapes for renewable energy systems		X	X	X		X

	PM	DM	PL	NGO	GP	AC
Toolbox for landscape-aware public participation in all stages of planning for renewable energy		X	X	X	X	
Publications						
Action website: information platform	X	X	X	X	X	X
Practice-oriented journal articles		X	X	X		
Peer-reviewed journal articles	X	X				X
Special issue of a peer-reviewed journal	X	X	X	X		X
Conference Documentation/Proceedings of Action Conference	X	X		X		X
Action book	X	X	X	X	X	X
Abbreviations: PM: Policy-Makers; DM: Decision-Makers; PL: Planners; NGO: Non-Governmental Organisations; GP: General Public; AC: Academics/Researchers						

H.3 How?

In section H.2, the main dissemination methods are already described. A dissemination strategy will be maintained throughout the Action to identify initial opportunities for audience engagement and dissemination, also using communication technologies or social media platforms. Participants will use their networks (e.g. landscape – LeNotre, ECLAS), and participation in international and national events (e.g. business and government - World Future Energy Summit, All Energy Exhibition), to provide information about the existence of its different information outlets (e.g. website open forum, products of guidelines and toolbox). The promotion of such tools will be also using relevant portals, websites and sectoral membership groups (e.g. UKRenewables, Royal Town Planning Institute).

The Action aims at a high impact nationally and internationally, also outside Europe. With many of the partners in this Action also involved in national thematic research networks or networks covering specific parts of Europe, it provides an ideal platform for knowledge transfer and dissemination of findings amongst academics. Global dissemination will be promoted by inviting international experts to the two Action conferences.

Concerted meetings between the Management Committee and Working Groups at single locations will allow for the international, multi- and transdisciplinary knowledge transfer described in section

C.2.

The Action will develop a broader network of practitioners (e.g. decision-makers, planners and representatives of relevant NGOs) drawn from those engaged with the case-study areas.

A core element of the dissemination plan is the Action website. Besides elements open to all target groups, there will be a password-protected section, which will only be accessible to the Action participants and invited external parties. The discussion fora will have separate login-protected sections for each of the Working Groups, for the Training Schools, case-study areas, etc. The work on the multilingual glossary (including definitions/explanations) will also take place in the password-protected part of the Action Website. As knowledge becomes more integrated and consolidated in the internal part of the interactive fora, information will be processed and published on the open part of the Action website.

For selected findings (such as the documentation of best practices) and the participation toolbox, translations in different languages and a synoptic form of presentation will support a wide dissemination amongst the general public, which is a special concern of the Action members.