Front page

DRAFT

Discussion version, 15.12.2003

Proposal full title: Todays High Performance Communities - Tomorrows hydrogen cities and villages.
Proposal acronym: HigHville
Date of preparation: 17.12.2003
Type of instrument: Integrated Project

List of participants (with country) with co-ordinator first:

The list is being revised, will follow later

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Proposal summary page

Todays High Performance Communities - Tomorrows Hydrogen Cities and Villages.

HigHville

Research areas/ topics addressed (If more than one, indicate their order of importance to the project)

Proposal abstract
copied from Part A (if not in English, include an English translation)

B.1 Scientific and technological objectives of the project and state of the art

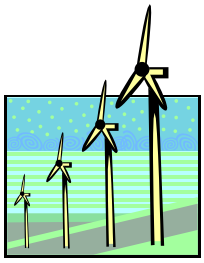
Describe in detail the proposed project's S&T objectives. The objectives should be those achievable within the project, not through subsequent development, and should be stated in a measurable and verifiable form. The progress of the project work will be measured against these goals in later reviews and assessments. Describe the state-of-the-art in the area concerned and how the proposed project will enhance the state-of-the-art in that area. (Recommended length – up to three pages)

The HigHville project will seek to meet the CONCERTO challenge from three perspectives, all of which are crucial to the successful fulfillment of the CONCERTO objectives. Although the Technology Demonstration perspective represents the main budgetary part of the project, the HigHville project will have an equally high focus of the other two perspectives, namely the Strategy Integration and the Society Participation.

1. STRATEGY INTEGRATION:

By developing a framework for integrated energy planning, decision making and implementation capacity in local communities and their local energy markets, for the benefit of the citizens. The HigHville model encompass all the three perspectives in one holistic approach.

2. TECHNOLOGY DEMONSTRATION:



By demonstrating efficient and medium/low-risk technologies in a way that can help local communities transforming their integrated energy planning capacity into successful implementation.

3. SOCIETY PARTICIPATION:

By involving the citizens and end-users in the whole planning and implementation process, and thereby developing a true citizen engagement, job creation and increased quality of life.

B.1.1 HigHville – Strategic integration

"Short-term action in a medium-term business strategy"

The HigHville concept that has been developed by Norsk Hydro is built on short-term action in a medium-term business strategy. Norsk Hydro's medium-term business strategy involves the introduction of hydrogen in an integrated energy system. This will bring added value to the

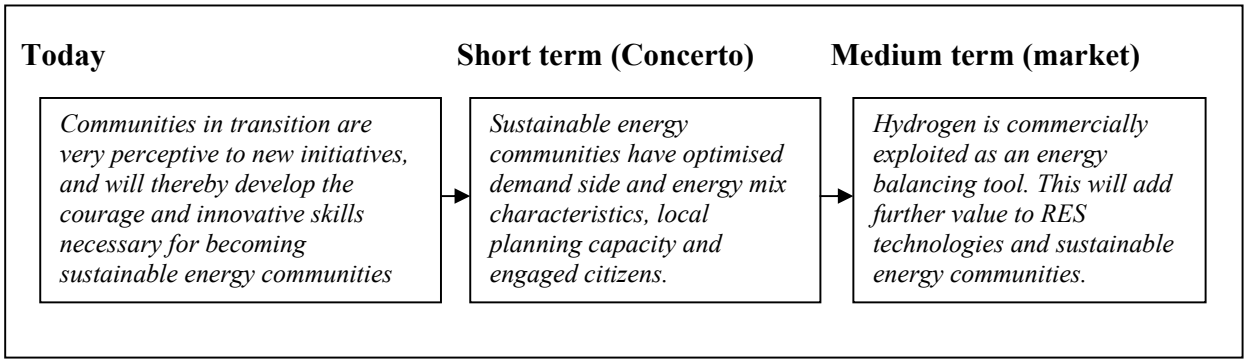
company's natural gas, power and renewable energy activities, as well as opening new business areas for Norsk Hydro's hydrogen production activities.

However, the success of this business strategy depends mainly on 2 critical success factors:

1. Product develop will gradually improve and provide the necessary technologies at the right cost. Norsk Hydro and others are actively involved in this, e.g. the Utsira project.
2. Only energy systems with certain demand side- and supply mix characteristics will merit the label "sustainable energy systems". Norsk Hydro believes that the sustainable energy systems will be best fit to capitalize from new technologies in the overall energy mix, and in the case of hydrogen particularly as an energy integrating tool, e.g. power grid balancing.

The first factor is not a topic of the CONCERTO initiative, as such activities are covered by other FP6 Calls. The second factor, however, is indeed so. In a short-term perspective, initiatives at the local level is key to the development of sustainable energy systems. The local initiatives should focus on optimising the physical demand side- and energy mix characteristics, enhance local planning mechanisms and support the active involvement of the citizens. The main objective is to develop the way in which these play together in a concerted way.

The HigHville-Strategy can also be illustrated as follows:



Hence, Norsk Hydro believes that it is necessary to identify, improve, and prepare the organisation and infrastructure of communities of today so that these communities can become HigHvilles of tomorrow. This is best done through relevant field demonstrations.

B.1.1.1 Vision

The first hydrogen cities and villages will emerge from the most advanced communities in terms of innovation, courage and sustainability. The HigHville initiative will prepare the front-runners by demonstrating the feasibility, both in technical, economical and administrative terms, of developing communities with innovative ideas, courageous planning concepts and momentum for implementation, into sustainable energy communities.

B.1.1.2 Major Hypotheses

"Communities in transition will optimise the "Concerto" between the actors"

The HigHville - Strategy is based on two major hypotheses:

1. Communities in transition are forced to find innovative solutions, make courageous decisions and implement their strategies. Becoming a sustainable energy community could be one such strategy, as the same critical success factors, *innovation, courage and implementation* are valid for both.

2. Sustainable energy communities have optimised the "concerto" between the energy market drivers and technologies, the local authorities, and the energy citizens. In this context it will be important to have short, medium and long term strategies and commitments for the development of sustainable energy supply, efficient use of energy and the affiliated effects such as job creation, quality of life and health.

This second hypothesis is best illustrated by the model shown in the following.

B.1.1.3 HigHville Model

The three circles in the HigHville model each represent various stakeholders of critical importance for successful implementation of new technologies and strategies for sustainable development.

- the technology suppliers to the energy market actors that from a business perspective aim to achieve a critical mass for their products and services (e.g. utility, local biomass suppliers, developers, technology suppliers)
- the local authorities (e.g. politicians, municipal planners, social services)
- the citizens and other local energy consumers (e.g. households, businesses, consumer associations).

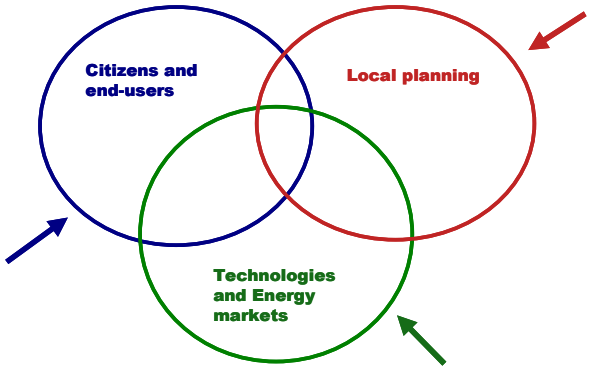
All three circles/areas have individually a theoretical potential for achieving results, however, it is only the small area in the middle, where the three circles meet that represent the achievable result. The challenge is therefore to identify all the critical success factors in the three areas, in a short, medium and long term strategic picture, which together will contribute to expanding the concerted area in the middle, the true *sustainable energy community.* This is a huge task that requires a firm and cross cutting methodology which will be expanded, fine-tuned and demonstrated in all the communities that participate in HigHville.

One main task of the HigHville project is thus to identify, classify and specify the general factors, and make them operational so that they can be introduced into the HigHville Model. The model will then develop individual fingerprints of each community by adding the specific factors. By using the model, certain critical success factors of general interest to many of the HigHville communities will emerge. These will be assessed with a view to investigate them further in terms of one or more accompanying studies throughout the project. At this moment it is of course

difficult to predict the exact topics of these accompanying studies, but since they will deal with the key questions related to the successful integration of technologies in sustainable energy communities, they will in fact represent a group of very important deliverables from the project.

To pick a relevant example of one such critical success factor, it is obvious that the process where a developer is being persuaded to set extra high energy standards for an urban regeneration scheme, is critical for the long term (economic life-time) impact from this urban development. The timing, mechanisms, arguments and persuasive elements (costing, local regulations etc…) in such processes can in many cases be the key to the successful implementation of sustainable technologies in this context.

HigHville-model



HYVILLE Model Scoring (example)

Local authorities	Score 1-3	Citizens and end users	Score 1-3	Technologies and market	Score 1-3
Political commitment and stability	3	Degree of energy awareness (private)	3	Balanced energy mix	3
Decision making autonomy	1	Degree of energy awareness (business)	2	Critical size of RES markets	3
Planning competence	2	Concern for the environment	3	New technologies tested	3
Planning documents	3	Community loyalty	2	Degree of liberalisation	1
Own financial strength	1		2	Climate for innovation	2
Total	**10**		**12**		**12**

The example above indicates that the community in question is well advanced on the citizens and energy market side, but that it still has a way to go the develop the local planning capacity.

B.1.2 HigHville - Technology Demonstration

About the technologies, hydrogen…….

B.1.3 HigHville – Society Participation

Citizen awareness, job creation, quality of life…..

B.2 Relevance to the objectives of this Priority Thematic Area

Describe in detail the manner how the proposed project's objectives contribute to the scientific, technical, wider societal and policy objectives of this Priority in the areas concerned. (Recommended length – up to two pages)

To be done (NH)

B.3 Potential impact

Describe the strategic impact of the proposed project, for example in reinforcing competitiveness and/ or on solving societal problems, including the relation (e.g. support) to Community policies. Describe the innovation-related activities1. Describe the exploitation and/or dissemination plans which are foreseen to ensure use of the project results. Describe the added-value in carrying out the work at a European level. Indicate what account is taken of other national or international research activities. (Recommended length – up to three pages)

To be done (NH)

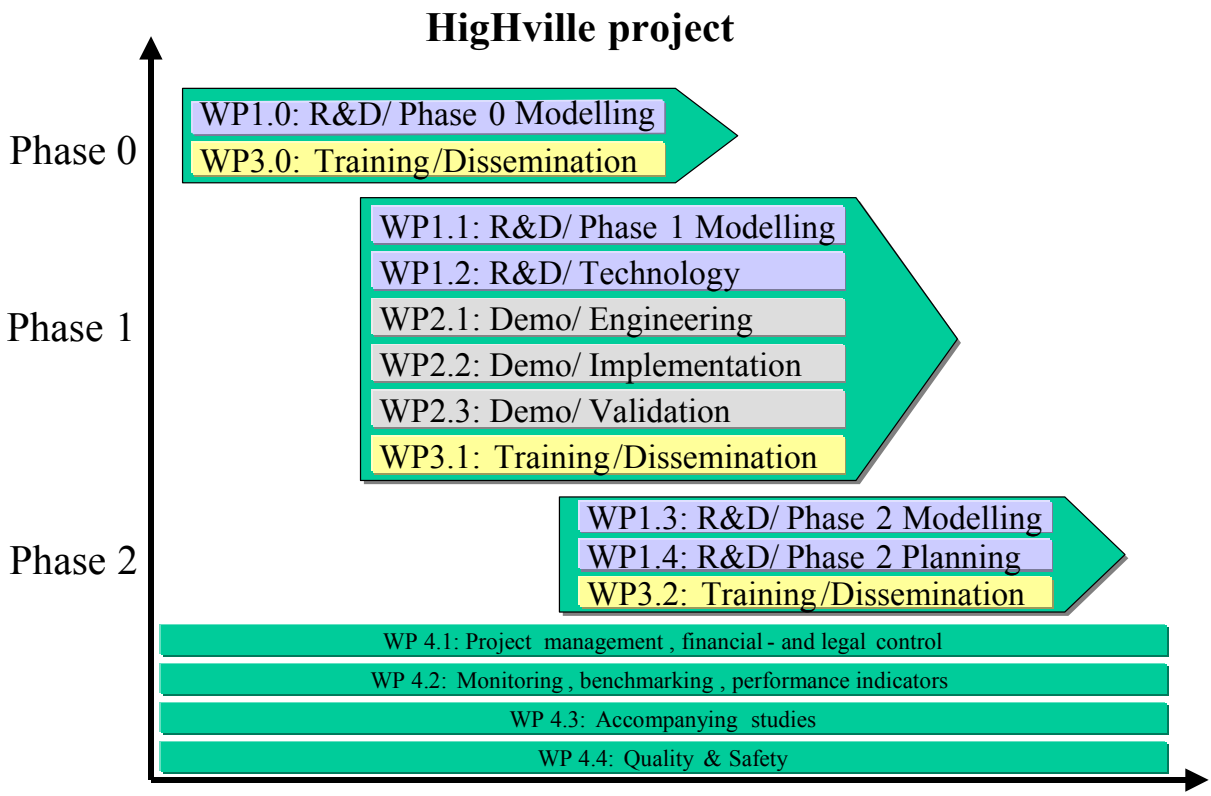
B.3.1 Contributions to standards

Describe contributions to national or international
standards (including pre-normative research) which may be made by the project, if any.
(Recommended length – one page)

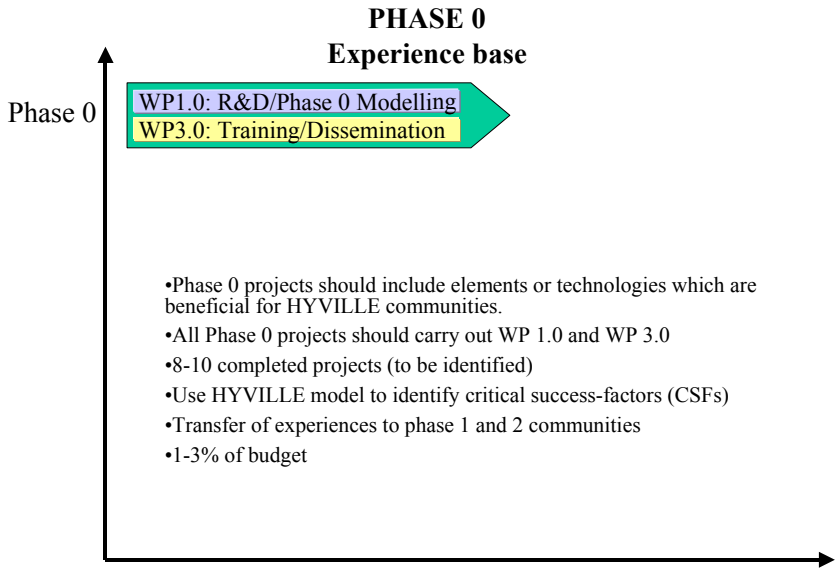
B.4 Outline implementation plan

Describe the proposed S&T approach, and show how this approach will enable the project to achieve its objectives. Describe the overall implementation plan broken down to the level of activities and the components of each of the activities1. Describe each of the components, identify who will carry out each. Show how this plan integrates the various components to a coherent project.

The HIGHVILLE project will be implemented according to the structure shown in the figure below:



The phase 0 projects will be the experience base of the HigHville communities, and the aim is to provide best practice, state of the art technologies and implementation experiences into the HigHville communities. The phase 0 base will be continuously updated and expanded throughout the whole project period in order to secure the best available basis for successful implementation of the HigHville demonstration activities.



B.4.1 Research, technological development and innovation activities:

Explain how the research/innovation effort of the project is comprised of a number of different components (major elements or blocks of work). Describe each of these components, identify who will carry out each. Show the relevance and contribution of each to the project as a whole. The description of the innovation components should cover the plans for management of knowledge and of intellectual property; a description of the exploitation of results and a plan for disseminating of knowledge beyond the consortium.

Put in the model description + individual technology R&D needs

B.4.2 Demonstration activities:

Under this heading, all the specific demonstration projects should be described. Both in text as well as in summary tables. The descriptions of the related activities and issues such as R&D, participants, performance indicators etc are described in detail in annex B.11, where the texts below originates from.

Description of the demonstration action (scope, scale, objectives, validation and success criteria)

B.4.2.1 Demonstration site – Middlehaven, Middlesbrough

Text from "Integration challenge"

B.4.2.1.1 Large scale integration of Renewable Energy Sources – xx

B.4.2.1.2 Eco-buildings – xx

B.4.2.1.3 Polygeneration – xx

B.4.2.2 Demonstration site - Ærø

Text from "Integration challenge"

B.4.2.2.1 Large scale integration of Renewable Energy Sources – xx

B.4.2.2.2 Eco-buildings – xx

B.4.2.2.3 Polygeneration – xx

B.4.2.3 Demonstration site – Abruzzo region

Text from "Integration challenge"

Integration challenge

The background for the Abruzzo project is an aim to develop a decentralised energy supply system for rural communities. Lack of acceptance for more renewable power, e.g. wind-power, have created a demand for products and services where the community can benefit from wind-power parks and other major installations. Several measures are being planned such as more small-scale distributed power and energy systems. Use of local micro wind-mill for distributed systems in rural areas. Production and development of hydrogen for niches in the transport market, e.g. Italian two-wheelers.

The current situation is that the distribution of power, even generated by renewable energy sources, is done through the national grid system (GRTN) and then locally by local distributors as in our instance ENEL Distribuzione. Target of the project is to utilize the necessary amount of produced power from RES within the valley with dedicated power lines also with the use, at a sustainable cost, of hydrogen as a vector. Local lines within Hyvalley can be installed immediately for biomass, biogas, use of hydrogen and for low impact fuels.

In order to meet this challenge, Abruzzo will demonstrate technologies within … main areas:

B.4.2.3.1 Polygeneration

- Polygeneration – based on biogas from waste, small-scale CHP, biomass supplied medium-scale CHP
    - Increased integration of surplus energy (e.g. landfill biogas, biomass)

B.4.2.3.2 Large scale integration of Renewable Energy Sources

- Integrate renewable power in local energy supply
    - Test systems for storage of renewable power
    - Further development of local existing micro wind turbine industry
    - Acceptance of renewable power by local benefits
    - Development of scooter engines powered by natural gas

B.4.2.3.3 Eco-buildings

- Eco-buildings: system solutions for eco-buildings that can be replicated and exported

B.4.2.4 Demonstration site – Western Isles

Text from "Integration challenge"

B.4.2.4.1 Large scale integration of Renewable Energy Sources – xx

B.4.2.4.2 Eco-buildings – xx

B.4.2.4.3 Polygeneration – xx

B.4.2.5 Demonstration site – Miljøbyen Grenland

Text from "Integration challenge"

B.4.2.5.1 Large scale integration of Renewable Energy Sources – xx

B.4.2.5.2 Eco-buildings – xx

B.4.2.5.3 Polygeneration – xx

B.4.2.6 Demonstration activities Summary table

Community/Topic	**Demo action**	**Duration**	**Budget**	
Middlehaven		Months	Eligible Costs (€)	Support (€)
Large Scale RES	Fuel cells	48	1.000.000	350.000
Eco-buildings	Science centre	48	1.000.000	350.000
Polygeneration	Domestic CHP	36	1.000.000	350.000
Subtotal			3.000.000	1.050.000
Ærø		Months	Eligible Costs (€)	Support (€)
Large Scale RES	Fuel cells	48	1.000.000	350.000
Eco-buildings	Science centre	48	1.000.000	350.000
Polygeneration	Domestic CHP	36	1.000.000	350.000
Subtotal			3.000.000	1.050.000
Abruzzo		Months	Eligible Costs (€)	Support (€)
Large Scale RES	Fuel cells	48	1.000.000	350.000
Eco-buildings	Science centre	48	1.000.000	350.000
Polygeneration	Domestic CHP	36	1.000.000	350.000
Subtotal			3.000.000	1.050.000
Western Isles		Months	Eligible Costs (€)	Support (€)
Large Scale RES	Fuel cells	48	1.000.000	350.000
Eco-buildings	Science centre	48	1.000.000	350.000
Polygeneration	Domestic CHP	36	1.000.000	350.000
Subtotal			3.000.000	1.050.000
Miljøbyen Grenland		Months	Eligible Costs (€)	Support (€)
Large Scale RES	Fuel cells	48	1.000.000	350.000
Eco-buildings	Science centre	48	1.000.000	350.000
Polygeneration	Domestic CHP	36	1.000.000	350.000
Subtotal			3.000.000	1.050.000

Grand Total - Demonstration			**15.000.000**	**5.250.000**

R&D effort in relation to demonstration activities

Explain how the research/innovation effort of the project is comprised of a number of different components (major elements or blocks of work). Describe each of the components, identify who will carry out each. Show the relevance and contribution of each to the research work elements of the project on which these demonstration activities are fully or partly based. Show contingency planning for unexpected outcomes of the research work.

Description of the demonstration action (scope, scale, objectives, validation and success criteria)

Present a comprehensive description of the proposed demonstration action, including its scope, scale, objectives, validation methodology and success criteria. The demonstration

should include a quantified assessment of performance, as well as a qualitative assessment in terms of viability and user acceptability. Include, where appropriate, technical details or anticipated performance targets.

Identify each demonstration site, and explain the status of any authorisations, agreements or permits needed for each site.

Identify the proposed participants in the demonstration, and explain their roles and responsibilities in the project in the context of an outline validation plan.

Propose a set of performance indicators against which the technical/economic/operational performance and ultimate success of the project can be judged. Indicator metrics (e.g. capacity increases, safety improvements, efficiency increases, cost reduction, returns on investment, running costs, payback times, environmental impacts, and other quantifiable impacts and benefits) should be given in sufficient detail to permit them to be checked by the proposal evaluators.

Describe the measurement and monitoring systems, which will be used to verify the performance of the system and the fulfillment of the project objectives. Monitoring should be performed in accordance with international standards or recognised practices and, preferably, should form part of a management system, which will ensure continuous performance optimisation on a long term basis.

B.4.3 Training activities:

Describe each of these components, identify who will carry out each. Show the relevance and contribution of each to the project as a whole, and their role in disseminating information that will raise awareness of the scientific work being undertaken both inside and outside the project.

To be done (NH)

B.4.4 Management activities:

Describe each of these components, identify who will carry out each. Show the relevance and contribution of each to the project management plans described in section B.6 below.
(Recommended length for the whole of section B.4 – up to twenty-five pages).

To be done (NH)

B.5 Description of the consortium

Describe the participants in the proposed project, including the role(s) of any participants, which are not yet identified, and the main tasks attributed to them. Describe how the participants collectively constitute a consortium capable of achieving the project objectives, and how they are suited and are committed to the tasks assigned to them. Show complementarity between participants, describe the industrial/commercial involvement foreseen to ensure exploitation of the results. Show how the opportunity of involving SMEs has been addressed. (Recommended length – up to five pages)

If there are as-yet-unidentified participants in the project, the expected competences, the role of the potential partners and their integration into the running contract should be described. (Recommended length – two pages)

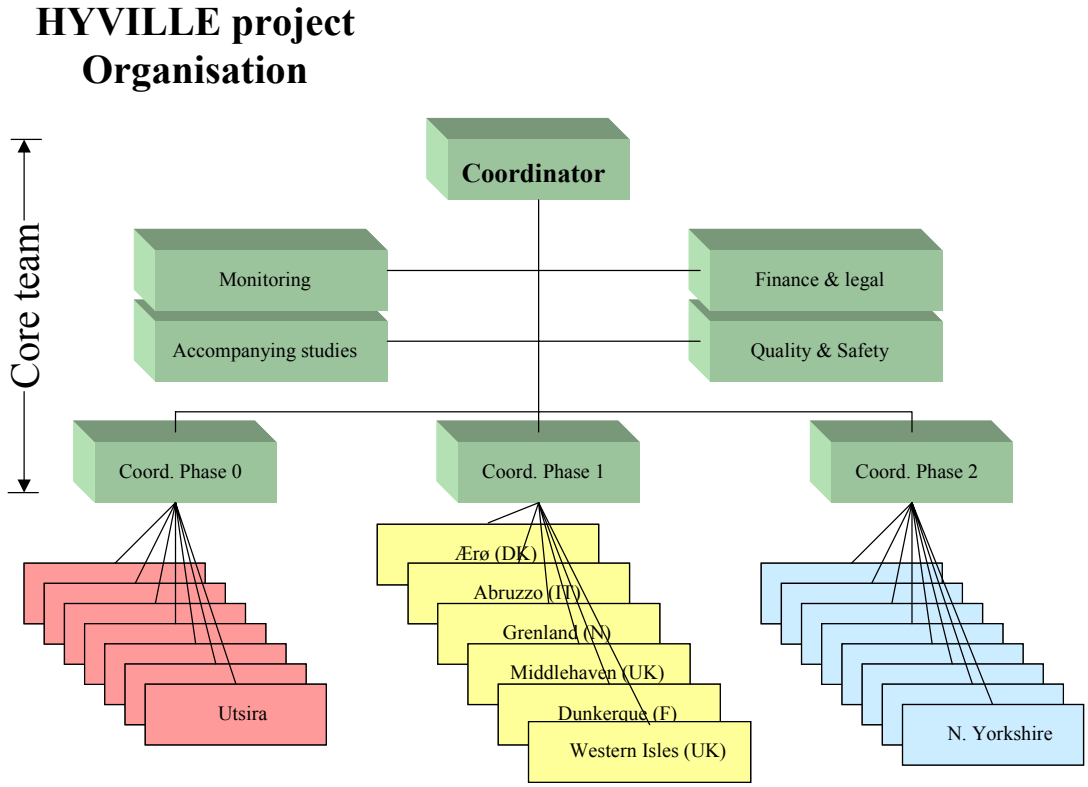
If any major part of the work is foreseen to be sub-contracted by the participant responsible for it, describe the work involved and explain why a sub-contract approach has been chosen for it. (Recommended length – one page)

If any of the participants are based outside of the EU Member and Associated States, INCO target countries or countries having a RTD co-operation agreement with the European Community, explain in terms of the project's objectives why these participants have been included, describe the level of importance of their contribution to the project results and their exploitation rights. (Recommended length –one page).

B.6 Description of project management

Show how the project organisational structure and decision-making mechanisms is matched to the complexity of the project and to the degree of integration required; show how the project management will enable the project to achieve its goals, and that there is a plan for the management of knowledge, of intellectual property and of other innovationrelated activities arising in the project. If the addition of participants during the lifetime of the project is foreseen, show how the management structure will adapt for this. (Recommended length – up to five pages).

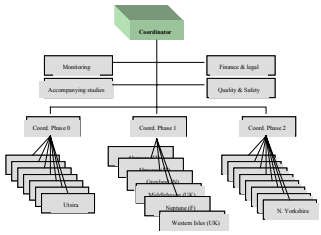
Will be revised (NH)



The HIGHVILLE project will be managed through a traditional management structure with a core team to undertake all managerial tasks such as Monitoring, Finance and legal control, Quality and safety as well as the coordination of activities throughout phases and between partners. The coordinator will report to a steering committee, which will be set up in collaboration with the European Commission upon contract signature.

B.6.1 Coordinator

The overall task of coordinating the project will be managed by Norsk Hydro (N). Norsk Hydro's experience from managing large R&D as well as and investment projects both onshore and offshore will ensure a professional ……

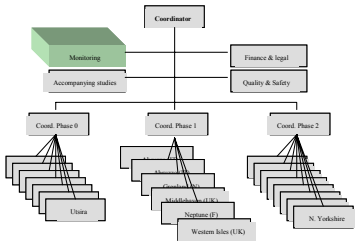


The tasks to be undertaken by the coordinator are:

- Lead WP 4.1 (Project management, financial and legal control)
- Liaese with the EC through a designated steering committee
- Manage consortium agreement
- Negotiate contract and coordinate updating of work programme
- Overall coordination and supervision of progress
- Compilation of interim reports and final report
- Administration of payments
- Initiate and lead core team meetings
- Initiate and lead full consortium meetings

B.6.2 Monitoring

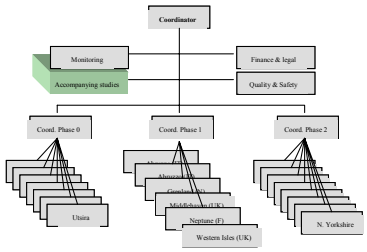
The task of monitoring the project will be managed by Institute for energy technology – IFE (N). The monitoring will cover the technical and quantitative performance of the demonstration activities as well as the progress on more qualitative performance within the participating communities. IFE's experience in performance monitoring and industrial benchmarking, which has been compiled into the HIGHVILLE –model, will form the basis for the innovative approach the HIGHVILLE project will take for developing new and better tools and methodologies for establishing both quantitative and qualitative performance indicators for sustainable communities.



The tasks to be undertaken by the Monitor are:

- Lead WP 4.2 (Develop methodologies and routines for monitoring, benchmarking and performance indicators)
- Lead WP 1.0, 1.1 and 1.3 (R&D modelling for all communities in all phases)
- Report progress to coordinator (core team)

The task of managing the accompanying studies will be carried out by ….. The



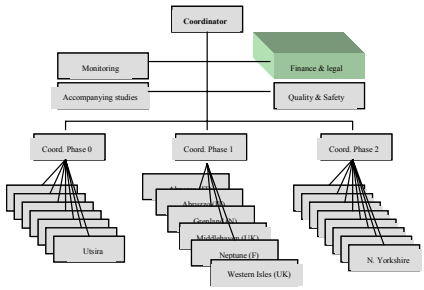
B.6.3 Accompanying studies

The tasks to be undertaken by the manager of the Accompanying studies are:

- Lead WP 4.3 (Initiate and supervise accompanying studies on technologies, methodologies, forecasting, assessments… to be specified)
- Lead WP 1.2 (Supervise and assist R&D on Technologies in the Phase 1 Communities)
- Lead WP 3.0, 3.1 and 3.2 (Training and dissemination)
- Report results to coordinator (core team)

B.6.4 Finance and Legal issues

The task of managing the finance and legal issues will be carried out by Norsk Hydro's financial and legal department. The……..

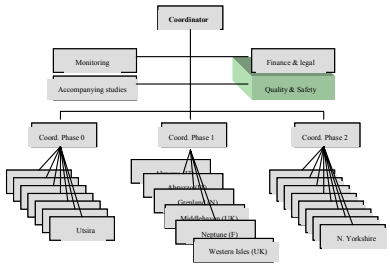


The tasks to be undertaken by the manager of the Finance and Legal issues are:

- Responsible for financial & legal control in WP 4.1
- Advice partners on contractual matters
- Supervise and act on contractual matters vis a vis the EC
- Monitor spending vis a vis budget
- Report status to coordinator (core team)

B.6.5 Quality and Safety

The task of managing the quality and safety issues will be carried out by xxx. The……..



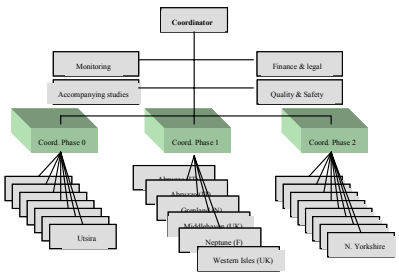
The tasks to be undertaken by the manager of the Quality and Safety issues are:

Lead WP 4.4

- Develop a methodology for quality improvement in all activities and deliverables
- Develop a guidance on safety work in the demonstration and implementation activities
- Develop a common monitoring scheme for quality and safety during the demonstration activities
- Develop a basis for future quality and safety work in integrated energy systems
- Develop a replication scheme for Quality and Safety in the project
- Report status to coordinator (core team)

B.6.6 Coordination within and between phases

The task of coordinating the activites within and between the different phases issues will be carried out by xxx. The……..



The tasks to be undertaken by the manager of the Coordination between phases are:

- Coordinate operations in phases 0, 1 and 2 respectively
- Monitor progress and spending in R&D and Demo activities (Phase 1)
- Monitor progress in R&D modelling and planning activities (Phase 2)
- Report status to coordinator (core team)

B.7 Project resources

B.7.1 IP Project Effort Form

IP Project Effort Form (form 1 of 6)
Full duration of the project
(insert the planned person-months for each activity in which a partner is involved)

Project acronym -

	Coordinator (HYDRO)	Partner 1 (DGL)	Partner 2 (MC)	Partner 3 (ÆRØ)	Partner 4 (ABR)
RTD/Innovation activities					**See R&D Note**
WP 1.0: Phase 0 Modelling					**on page 35**
WP 1.1: Phase 1 Modelling					
WP 1.2: Phase 1 Technology					
WP 1.3: Phase 2 Modelling					
WP 1.4: Phase 2 Planning					
Total research	0	0	0	0	0
Demonstration activities					
WP 2.1: Ph 2 Demo/Engineering					51
WP 2.2: Ph 2 Demo/Implementation					74
WP 2.3: Ph 2 Demo/Validation					92
Etc					
Total demonstration	0	0	0	0	217
Training activities					36
WP 3.0: Ph 0 Training/Dissemination					
WP 3.2: Ph 1 Training/Dissemination					
WP 3.3: Ph 2 Training/Dissemination					
Etc					
Total training	0	0	0	0	36
Management activities					8
WP 4.1: Management, finance/legal					
WP 4.2: Monitoring, performance					
WP 4.3: Accompanying studies					
WP 4.4: Quality & Safety					
Total management	0	0	0	0	8
TOTAL (ALL ACTIVITIES)	0	0	0	0	261

IP Project Effort Form (form 2 of 6)
Full duration of the project
(insert the planned person-months for each activity in which a partner is involved)

Project acronym -

	Partner 5 (WI)	Partner 6 (GRE)	Partner 7 (Phase 2)	Partner 8 (Phase 2)	Partner 9 (Phase 2)
RTD/Innovation activities					
WP 1.0: Phase 0 Modelling					
WP 1.1: Phase 1 Modelling					
WP 1.2: Phase 1 Technology					
WP 1.3: Phase 2 Modelling					
WP 1.4: Phase 2 Planning					
Total research	0	0	0	0	0
Demonstration activities					
WP 2.1: Ph 2 Demo/Engineering					
WP 2.2: Ph 2 Demo/Implementation					
WP 2.3: Ph 2 Demo/Validation					
Etc					
Total demonstration	0	0	0	0	0
Training activities					
WP 3.0: Ph 0 Training/Dissemination					
WP 3.2: Ph 1 Training/Dissemination					
WP 3.3: Ph 2 Training/Dissemination					
Etc					
Total training	0	0	0	0	0
Management activities					
WP 4.1: Management, finance/legal					
WP 4.2: Monitoring, performance					
WP 4.3: Accompanying studies					
WP 4.4: Quality & Safety					
Total management	0	0	0	0	0
TOTAL (ALL ACTIVITIES)	0	0	0	0	0

IP Project Effort Form (form 3 of 6)
Full duration of the project
(insert the planned person-months for each activity in which a partner is involved)

Project acronym -

	Partner 10 (Phase 2)	Partner 11 (Phase 2)	Partner 12 (Phase 2)	Partner 13 (Phase 2)	Partner 14 (Phase 2)
RTD/Innovation activities					
WP 1.0: Phase 0 Modelling					
WP 1.1: Phase 1 Modelling					
WP 1.2: Phase 1 Technology					
WP 1.3: Phase 2 Modelling					
WP 1.4: Phase 2 Planning					
Total research	0	0	0	0	0
Demonstration activities					
WP 2.1: Ph 2 Demo/Engineering					
WP 2.2: Ph 2 Demo/Implementation					
WP 2.3: Ph 2 Demo/Validation					
Etc					
Total demonstration	0	0	0	0	0
Training activities					
WP 3.0: Ph 0 Training/Dissemination					
WP 3.2: Ph 1 Training/Dissemination					
WP 3.3: Ph 2 Training/Dissemination					
Etc					
Total training	0	0	0	0	0
Management activities					
WP 4.1: Management, finance/legal					
WP 4.2: Monitoring, performance					
WP 4.3: Accompanying studies					
WP 4.4: Quality & Safety					
Total management	0	0	0	0	0
TOTAL (ALL ACTIVITIES)	0	0	0	0	0

IP Project Effort Form (form 4 of 6)
Full duration of the project
(insert the planned person-months for each activity in which a partner is involved)

Project acronym -

	Partner 15 (Phase 2)	Partner 16 (Phase 2)	Partner 17 (Phase 2)	Partner 18 (Phase 2)	Partner 19 (Phase 2)
RTD/Innovation activities					
WP 1.0: Phase 0 Modelling					
WP 1.1: Phase 1 Modelling					
WP 1.2: Phase 1 Technology					
WP 1.3: Phase 2 Modelling					
WP 1.4: Phase 2 Planning					
Total research	0	0	0	0	0
Demonstration activities					
WP 2.1: Ph 2 Demo/Engineering					
WP 2.2: Ph 2 Demo/Implementation					
WP 2.3: Ph 2 Demo/Validation					
Etc					
Total demonstration	0	0	0	0	0
Training activities					
WP 3.0: Ph 0 Training/Dissemination					
WP 3.2: Ph 1 Training/Dissemination					
WP 3.3: Ph 2 Training/Dissemination					
Etc					
Total training	0	0	0	0	0
Management activities					
WP 4.1: Management, finance/legal					
WP 4.2: Monitoring, performance					
WP 4.3: Accompanying studies					
WP 4.4: Quality & Safety					
Total management	0	0	0	0	0
TOTAL (ALL ACTIVITIES)	0	0	0	0	0

IP Project Effort Form (form 5 of 6)
Full duration of the project
(insert the planned person-months for each activity in which a partner is involved)

Project acronym -

	Partner 20 (IFE)	Partner 21 (CRES)	Partner 22 (H2Dev)	Partner 23 (RTV)	Partner 24 (EE)
RTD/Innovation activities					
WP 1.0: Phase 0 Modelling					
WP 1.1: Phase 1 Modelling					
WP 1.2: Phase 1 Technology					
WP 1.3: Phase 2 Modelling					
WP 1.4: Phase 2 Planning					
Total research	0	0	0	0	0
Demonstration activities					
WP 2.1: Ph 2 Demo/Engineering					
WP 2.2: Ph 2 Demo/Implementation					
WP 2.3: Ph 2 Demo/Validation					
Etc					
Total demonstration	0	0	0	0	0
Training activities					
WP 3.0: Ph 0 Training/Dissemination					
WP 3.2: Ph 1 Training/Dissemination					
WP 3.3: Ph 2 Training/Dissemination					
Etc					
Total training	0	0	0	0	0
Management activities					
WP 4.1: Management, finance/legal					
WP 4.2: Monitoring, performance					
WP 4.3: Accompanying studies					
WP 4.4: Quality & Safety					
Total management	0	0	0	0	0
TOTAL (ALL ACTIVITIES)	0	0	0	0	0

IP Project Effort Form (form 6 of 6)
Full duration of the project
(insert the planned person-months for each activity in which a partner is involved)

Project acronym -

	Partner 25 (nn)	Partner 26 (nn)	Partner 27 (nn)	Partner 28 (nn)	Partner 29 (nn)
RTD/Innovation activities					
WP 1.0: Phase 0 Modelling					
WP 1.1: Phase 1 Modelling					
WP 1.2: Phase 1 Technology					
WP 1.3: Phase 2 Modelling					
WP 1.4: Phase 2 Planning					
Total research	0	0	0	0	0
Demonstration activities					
WP 2.1: Ph 2 Demo/Engineering					
WP 2.2: Ph 2 Demo/Implementation					
WP 2.3: Ph 2 Demo/Validation					
Etc					
Total demonstration	0	0	0	0	0
Training activities					
WP 3.0: Ph 0 Training/Dissemination					
WP 3.2: Ph 1 Training/Dissemination					
WP 3.3: Ph 2 Training/Dissemination					
Etc					
Total training	0	0	0	0	0
Management activities					
WP 4.1: Management, finance/legal					
WP 4.2: Monitoring, performance					
WP 4.3: Accompanying studies					
WP 4.4: Quality & Safety					
Total management	0	0	0	0	0
TOTAL (ALL ACTIVITIES)	0	0	0	0	0

B.7.2 IP Project Budget Form.

IP Project Budget Form (form 1 of 6)
Full duration of the project
(insert the planned budget (costs) for each activity in which a partner is involved)

Project acronym -

	Partner 1 short name	Partner 2 short name	Partner 3 short name	Partner 4 short name	Partner 5 short name
RTD/Innovation activities					
WP 1.1					
WP 1.2					
WP 1.3					
WP 1.4					
Total research	0	0	0	0	0
Demonstration activities					
WP 2.1					
WP 2.2					
WP 2.3					
Etc					
Total demonstration	0	0	0	0	0
Training activities					
WP 3.1					
WP 3.2					
WP 3.3					
Etc					
Total training	0	0	0	0	0
Management activities					
WP 4.1					
WP 4.2					
WP 4.3					
Etc					
Total management	0	0	0	0	0
TOTAL (ALL ACTIVITIES)	0	0	0	0	0

B.7.3 IP management level justification of resources and budget.

Describe the resources needed to carry out the project (personnel, equipment, finance…). The description of the resources and budget should support the description of the outline implementation plan, i.e. it should substantiate the description of the different activities, and help the evaluators to judge the implementation plan related to the estimated resources and budget needed. Demonstrate how the project will mobilise the critical mass of resources necessary for success; how the resources will be integrated to form a coherent project, and show that the overall financial plan for the project is adequate. (Recommended length – up to three pages).

B.8 Detailed implementation plan – first 18 months

This section describes in detail the work planned to achieve the objectives of the proposed project up to its first 18 months in operation. The recommended length, excluding the forms specified below, is up to 15 pages. An introduction should explain the structure of this 18-month detailed implementation plan and how the plan will lead the participants to achieve the objectives aimed for by that time. It should also identify significant risks, and contingency plans for these. The plan must be broken down into workpackages (WPs) which should follow the logical phases of the project during this period, and include management of the project and assessment of progress and results to this point. Essential elements of the plan are:

a) Detailed implementation plan introduction – explaining the structure of this plan and the overall methodology used to achieve the objectives of the first 18 months. Include a version of the form A3 which is used in Part A of the proposal, but covering just the first 18 months

b) Work planning, showing the timing of the different WPs and their tasks (Gantt chart or similar)

c) Graphical presentation of the components, showing their interdependencies (Pert diagram or similar)

d) Detailed work description broken down into workpackages:
Workpackage list (use Workpackage list form below);
Deliverables list (use Deliverables list form below);
Description of each workpackage (use Workpackage description form below, one per workpackage):

Note: The number and structure of workpackages used must be appropriate to the complexity of the work and the overall value of the proposed project. Each workpackage should be a major subdivision of the proposed project and should also have a verifiable end-point (normally a deliverable or an important milestone in the overall project). The planning should be sufficiently detailed to justify the proposed effort and allow progress monitoring by the Commission – the day-to-day management of the project by the consortium may require a more detailed plan.

Workpackage list (18 month plan)
HIGHVILLE overall

Work-package No[1]	Workpackage title	Lead contractor No[2]	Person-months[3]	Start month[4]	End month[5]	Deliv-erable No[6]
WP1.0	R&D/Phase 0 Modelling					
WP1.1	R&D/Phase 1 Modelling					
WP1.2	R&D/Technology					
WP1.3	R&D/Phase 2 Modelling					
WP1.4	R&D/Phase 2 Planning					
WP2.1	Demo/Engineering (See also separate WP forms per demonstration community)					
WP2.2	Demo/Implementation (See also separate WP forms per demonstration community)					
WP2.3	Demo/Validation (See also separate WP forms per demonstration community)					
WP3.0	Phase 0: Training/Dissemination					
WP3.1	Phase 1: Training/Dissemination					
WP3.2	Phase 2: Training/Dissemination					
WP4.1	Project management, financial- and legal control					
WP4.2	Monitoring, benchmarking, performance indicators					
WP4.3	Accompanying studies					
WP4.4	Quality & Safety					
	TOTAL					

[1] Workpackage number: WP 1 – WP n.
[2] Number of the contractor leading the work in this workpackage.
[3] The total number of person-months allocated to each workpackage.
[4] Relative start date for the work in the specific workpackages, month 0 marking the start of the project, and all other start dates being relative to this start date.
[5] Relative end date, month 0 marking the start of the project, and all ends dates being relative to this start date.
[6] Deliverable number: Number for the deliverable(s)/result(s) mentioned in the workpackage: D1 - Dn.

Workpackage list (60 month plan)
Demonstration Community – ABRUZZO (Partner 4)

Work-package No[7]	Workpackage title	Lead contractor No[8]	Person-months[9]	Start month[10]	End month[11]	Deliv-erable No[12]
ABR WP 1.1	Biogas from waste, polygeneration with small CHPs and experimentation on new engines-ENGINEERING	7	10	1	12	3
ABR WP 1.2	Biogas from waste, polygeneration with small CHPs and experimentation on new engines IMPLEMENTATION	5	14	12	36	3
ABR WP 1.3	Biogas from waste, polygeneration with small CHPs and experimentation on new engines VALIDATION	5	16	36	60	1
ABR WP 2.1	PV and energy efficiency applications in eco-buildings ENGINEERING	7	11	1	12	3
ABR WP 2.2	PV and energy efficiency applications in eco-buildings IMPLEMENTATION	7	20	12	36	2
ABR WP 2.3	PV and energy efficiency applications in eco-buildings VALIDATION	4	22	36	60	1
ABR WP 3.1	Test systems for storage, use and polygeneration from renewable power+ Support vehicle equipped with FC power generator ENGINEERING	4	12	1	12	4

[7] Workpackage number: WP 1 – WP n.
[8] Number of the contractor leading the work in this workpackage.
[9] The total number of person-months allocated to each workpackage.
[10] Relative start date for the work in the specific workpackages, month 0 marking the start of the project, and all other start dates being relative to this start date.
[11] Relative end date, month 0 marking the start of the project, and all ends dates being relative to this start date.
[12] Deliverable number: Number for the deliverable(s)/result(s) mentioned in the workpackage: D1 - Dn.

ABR WP 3.2	Test systems for storage, use and polygeneration from renewable power+ Support vehicle equipped with FC power generator IMPLEMENTATION	6	17	12	36	5
ABR WP 3.3	Test systems for storage, use and polygeneration from renewable power+ Support vehicle equipped with FC power generator VALIDATION	5	22	36	60	2
ABR WP 4.1	Mini wind power applications ENGINEERING	5	7	1	19	3
ABR WP 4.2	Mini wind power applications IMPLEMENTATION	5	9	12	30	1
ABR WP 4.3	Mini wind power applications VALIDATION	4	11	31	60	1
ABR WP 5.1	Biomass applications ENGINEERING	6	11	1	12	3
ABR WP 5.2	Biomass applications IMPLEMENTATION	7	14	13	30	2
ABR WP 5.3	Biomass applications VALIDATION	5	21	30	60	1
ABR WP 6	Training and dissemination	5	36	0	60	4
ABR WP 7	Management activities	1	8	0	60	3
	TOTAL		261			

Deliverables list (18 month plan)

Deliverable No[13]	Deliverable title	Delivery date [14]	Nature [15]	Dissemination level [16]
D 1.0	R&D/Phase 0 Modelling			
D 1.1	R&D/Phase 1 Modelling			
D 1.2	R&D/Phase 1Technology			
D 1.3	R&D/Phase 2 Modelling			
D 1.4	R&D/Phase 2 Planning			
D 2.1	Demo/Engineering (See also separate WP forms per demonstration community)			
D 2.2	Demo/Implementation (See also separate WP forms per demonstration community)			
D 2.3	Demo/Validation (See also separate WP forms per demonstration community)			
D 3.0	Phase 0: Training/Dissemination			
D 3.1	Phase 1: Training/Dissemination			
D 3.2	Phase 2: Training/Dissemination			
D 4.1	Project management, financial- and legal control			
D 4.2	Monitoring, benchmarking, performance indicators			
WP4.3	Accompanying studies			
WP4.4	Quality & Safety			

[13] Deliverable numbers in order of delivery dates: D1 – Dn

[14] Month in which the deliverables will be available. Month 0 marking the start of the project, and all delivery dates being relative to this start date.

[15] Please indicate the nature of the deliverable using one of the following codes:
R = Report
P = Prototype
D = Demonstrator
O = Other

[16] Please indicate the dissemination level using one of the following codes:
PU = Public
PP = Restricted to other programme participants (including the Commission Services).
RE = Restricted to a group specified by the consortium (including the Commission Services).
CO = Confidential, only for members of the consortium (including the Commission Services).

NOTE on R&D

The completion of a work package specifically developed for R&D has been considered, in view of our vision, as an integral part of the core development of the demonstration projects and therefore is included in each work package as an integrated issue. The University contributions (please consider that 5 Universities are participating) are totally integrated in the single projects for their unique responsibilities and knowledge. This will therefore enable an integrated vision between the demonstration and research aspects of the single projects. In addition this will give a scientific validation to all the activities.

Workpackage description (60 month plan)

Title: Biogas from waste, polygeneration with small CHPs and experimentation on new engines

Workpackage number	1	**Start date or starting event:**		Month 1				
Participant ID	ARAEN/RA	CIV	APR	ARTA	UNI AQ	MU N	CISI	
Person-months per participant:	7	6	15	3	5	2	2	

Objectives

Convey biogas, purification of biogas with production of natural gas, CHP plant from waste in order to heat and supply electricity to the grid to decrease peaks and alternatively to power local buildings. In addition, Aprilia will study and develop a high efficiency and low emission natural gas engines for scooters. Moreover, Aprilia will study the production of fuel cell technology in scooters.

Description of work (*indicating the role of each partner involved)*

WP 1.1 During the first period (1-12), CIV and the UNIAQ will engineer the biogas conveying and purification system with consequent storage. At approximately the same time, the above in collaboration with ENEL will engineer and size the small CHP with study for the connection to the grid and distribution of heat to the local buildings (6-12). Furthermore, APR personnel will oversee the engineering of the proper infrastructure needed for its operational purposes (1-12). CISI (local consortium of mechanical companies) will support the project by engineering and manufacturing mechanical parts for the development of the system.

WP 1.2 From month 12 through 36, the implementation of the purification and storage system will commence and also for the implementation of the CHP we foresee approximately from month 12 through 36 (CIV). APR and ARTA will initiate the testing and development period of those scooter engines powered by natural gas (month 12 through 36). At last, from month 18 through 24, the implementation of heat coming from the CHP to the local buildings will be performed. (ARAEN/RA). During this period, CISI will assess their production of parts and eventually modify them.

WP 1.3 At the end of the implementation period, there will be an efficiency assessment of the CHP and of its power connection to the grid (36 through 42). At the same time, APR will produce road-ready prototypes based on their research and testing (36 through 60). The project will be completed with a monitoring of the entire CHP module efficiency in safety. (ARAEN/RA, MUN, UNIAQ)

Deliverables

Month 6: Sizing of a small CHP with study for the connection to the grid and distribution of heat to the local buildings;

Month 10: Infrastructure needed for Aprilia operational purposes relating to new engines;

Month 12: Biogas conveying and purification system with consequent storage;

Month 22: First Aprilia engine-prototypes;

Month 26: Purification and storage system will commence, the CHP and its heat to the local buildings implemented;

Month 32: Contractual studies for the connection of the generated power to the grid;

Month 42: First Aprilia road-ready scooter prototypes.

Milestones[17] and expected results

Month 12: Engineering of the biogas conveying system, small CHP and APRILIA lab;

Month 21: Availability of experimental results on the prototype integrated CHP plant (engine-based). Experimental testing of control system on prototype;

Month 36: Implementation of the biogas purification system, CHP, the connection of heat and power, first APRILIA tests;

Month 60: Biogas and CHP monitoring and APRILIA road-ready prototypes.

[17] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Workpackage description (60 month plan)

Title: PV and energy efficiency applications in eco-buildings

Workpackage number	2		**Start date or starting event:**		Month 1				
Participant ID	ESCO	ARAEN /RA	MUN	GRTN	CF	ENEL	UNI PE 1/2	UNI AQ	WES	CISI
Person-months per participant:	5	9	3	1	-	2	22 (5+17)	2	7	2

Objectives

a. Experimental PV bio-architectural integration with installation on various beach resort of PV panels for the production of energy that will be utilized by the resort during the summer (4 months) and conveyed to the valley grid during the rest of the year (8 months). Due to project design differences, in order to study the efficiency and repeatability of this application, various types (designs) of beach resorts will be considered.

b. Creation of an ESCO that will initiate its activities by analysing the use of energy efficiency measures to decrease the municipal energy bill of the towns of Vasto and San Salvo. Assessment of the energy consumption in the municipalities within the project and adoption of energy efficiency measures to reduce their consumption.

Description of work (*indicating the role of each partner involved)*

WP 2.1 During the first 12 months, several activities must be performed: creation of a public-private ESCO company, engineering of PV panels on beach resorts (UNIPE2); ARAEN/RA, UNIPE1, GRTN and ENEL will define the contractual aspects related to the connection of the power generated by the PV panels to the grid; public power use analysis in the municipalities of San Salvo and Vasto (MUN, ESCO, UNIPE2). Based on the project design differences and on the technical studies related to the PV installations on the beach resorts, CISI will support those applications requiring special and non-commercial mechanical parts. UNIAQ will develop a computer integrated monitoring system on production, consumption and storage of energy (prototype of a distributed power computerized management system).

WP 2.2 The following steps to be covered during months 12 through 24 are: Installation of the PV panels on the beach resorts (WES, ARAEN/RA, CF, ENEL, CISI) and subsequent connection of the produced power to the grid; project studies (ESCO, MUN, UNIPE2) for the optimisation of energy consumption in public buildings and consequent first actions related to the energy efficiency (lamps, sensors etc…).

WP 2.3 During our validation period, from month 36 to 60, we will verify the efficiency and the model (economical and technological) of PV systems installed on the beach resorts, and furthermore we will implement additional energy efficient action in the proposed municipalities. (ARAEN/RA, ESCO, MUN, ENEL, UNIPE2)

Deliverables

Month 3: Selection of beach resort with various architectural elements to install PV panels;

Month 6: Contractual aspects related to the supply of power from the beach resorts' PV to the grid during their inactive period; public power use analysis in the municipalities of San Salvo and Vasto;

Month 12: Computer integrated monitoring system on production, consumption and storage of energy (prototype of a distributed power computerized management system);

Month 20: Optimisation of energy consumption in public buildings and consequent first actions related to the energy efficiency;

Month 22: Installation of PV panels on the beach resorts, connection to the grid and start of business;

Month 40: Verification of the efficiency and the model (economical and technological) of PV systems installed on the beach resorts and connected to the grid. Additional energy efficient action in the proposed municipalities.

Milestones[18] and expected results

Month 12: Proper engineering for the PV beach resort application, energy efficiency actions and analysis of the energy consumption in the proposed municipalities;

Month 36: Installation of the PV panels on the beach resort and thanks to the contractual agreement with ENEL connection to the grid, implementation of best energy efficient methods and optimisation of the energy consumption in the Vasto and San Salvo public buildings;

Month 60: System verification.

[18] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Workpackage description (60 month plan)

Title: Test systems for storage, use and polygeneration from renewable power and support vehicle equipped with FC power generator

Workpackage number	3		**Start date or starting event:**		Month 1			
Participant ID	ARAEN/ RA	AIRL	UNI AQ	UNI FE	UNI PE 1	UNI BA	WES	COS	
Person-months per participant:	5,5	20	10	5	1,5	4	1	4	

Objectives

This demonstration project will be developed in the Cupello 1MW PV plant. The target is to produce hydrogen from solar energy and to utilize it locally in a small fuel cell that will power, in tri-generation, the eco-building located in the site. The production of hydrogen is done through an electrolyser. The electrolyser will be powered in part by the existing PV panels and in part by the installation of a PV concentrator. The hot water produced by the PV concentrator, by the fuel cell and by the solar thermal panels, will be conveyed towards the needs of a local greenhouse and to satisfy the thermal needs of the local eco-building. Creation of a new energy (hydrogen) information and dissemination info point.

The project also provides for the production of a natural gas engine powered support vehicle equipped with a module for the generation of power from a fuel cell. This vehicle will be based and re-charged in the Cupello PV plant. The intended use of this vehicle is that of a mobile power unit to be deployed in case of secondary support after major emergencies, major sport events, public events etc…The fuel cell module installed on the vehicle has also as secondary application: the backup power system of the eco-building that would temporarily substitute an eventual main power loss. It is clear that this vehicle has a very high demonstrative impact and would be an integral part of the new energy (hydrogen) dissemination and info point on site. This experimental project is thought for a pollution free exhaust and noise application.

Description of work (*indicating the role of each partner involved)*

WP 3.1 This first step is based on the studies of the UNIFE (3.1.1), UNIBA (3.1.2) e UNIAQ (3.1.3). Each University staff will work in periodic exchange of data to arrive to a global analysis of the system.

3.1.1 The first 6 months will be devoted to the PV concentrator system technical design taking into account the requirements of the specific application and to installation site analysis with a preliminary proposal for installation layout. Initial development of the system (both the thermal and PV part will take place).

3.1.2 The research team of the University of Bari (UNIBA) will develop an energetic numerical model simulating the horticultural greenhouse microclimate (1-12 months).

3.1.3 The target of the UNIAQ together with AIRL, during the first 12 months, is to study the size of the hydrogen production and storage facility plant and for the installation of the fuel cell. In addition, they will perform the study and analysis of the amount of power necessary to produce hydrogen through water electrolysis and also of the data related to the amount of hydrogen necessary to power the fuel cell.

3.1.4 From month 1 to 12: engineering of a fuel cell energy system (Air Liquide, University of L'Aquila - Engineering) and engineering of the modified vehicle that will carry the FC module.

ARAEN/RA during this initial period, will dedicate its energies to the resolution of all administrative requirements necessary for the further implementation of the proposed projects.

WP 3.2 In this period we have considered the principal activities of the Universities (UNIFE 3.2.1, UNIBA 3.2.2 and UNIAQ 3.2.3) to develop the H2 system and the production and installation of solar thermal panels by WES with the logistical support of COS (months 12 through 36).

3.2.1 The following 6 months will be devoted to the development (in Ferrara) of the concentrator dish and to the development of a more precise installation definition including the requested civil work (concrete basements, pipeline deployment, electric connections requirements etc.). At the same time the development of the system will continue;

The following 6 months will be employed to conclude the physical assembly of the concentrator system except for the photovoltaic part and to the deployment and installation of the system in the Abruzzo site where, in the meantime, the necessary work has to be completed;

The following 6 months will be employed for system optimisation on site (concerning hot water production) and initial data acquisition. At the same time the PV panel development will continue;

The following 12 months will be employed to complete the photovoltaic modules and to install them on the already operational concentrators beginning complete system operation. Data acquisition will continue on the thermal part.

3.2.2 Application of the simulation model to the greenhouse in Cupello – Definition of the suitable covering material and of the heating system (12-30 months).

3.2.3 Creation and implementation of the system able to the production, storage end final use of hydrogen (with the contribute of AIRL) (months 12-24). Connection to the Cupello Ecobuilding and to the electrical national grid (24-36). (ARAEN/RA)

3.2.4 From month 12 to 24: implementation of the vehicle with the FC module and with a communication system (AIRL, UNIAQ, COS, ARAEN/RA); build the base location of the mobile unit in the Cupello PV plant. During the following 12 months, we will train the personnel that will manage and utilize the unit.

WP 3.3 The activities will be focused on the analysis, the valuation and the optimisation of the system. (UNIFE 3.3.1, UNIBA 3.3.2, UNIAQ 3.3.3)

3.3.1 The following 18 months will be employed in system optimisation, data collection and the development of a complete report on system performance and capabilities.

3.3.2 Collection of the data gathered during the tests carried out in Cupello concerning energy consumption and agronomic yield (36-48 months);
Evaluation of the results of the tests concerning the greenhouse heating system supplied by warm water from renewable energy sources (36-54 months).

3.3.3 System verification and optimisation according to energetic plans and safety.

3.3.4 The last months (36-60) will be used to test and assess the mobile unit and therefore initiate its utilization during symbolic events (sport, cultural and in case of major emergencies as secondary support).

Deliverables

Month 6: PV concentrator system technical design; engineering of a fuel cell energy system to be installed in a modified vehicle that will carry the FC module.
Month 10: Develop an energetic numerical model simulating the horticultural greenhouse microclimate;
Month 10: Resolution of all administrative requirements necessary for the further implementation of the proposed projects;
Month 12: Availability of simulation models of the components and of the whole plant (FC-based). Sizing of the hydrogen production and storage facility plant and for the installation of the fuel cell;

Month 18: Development of the concentrator dish and the development of a more precise installation definition including the requested civil work;
Month 21: Availability of experimental results on the prototype integrated CHP plant (FC-based);
Month 24: Application of the simulation model to the greenhouse in Cupello;
Month 25: Implementation of the vehicle with the FC module and with a communication system and initiate personnel training;
Month 28: Creation and implementation of the system able to the production, storage end final use of hydrogen. Connection to the Cupello Ecobuilding and to the electrical national grid;
Month 48: Analysis, assessment, evaluation and optimisation of the system;
Month 50: Test and assess the mobile unit and initiate its utilization during symbolic events.

Milestones[19] and expected results

Month 12: Studies and engineering of the hydrogen system, PV concentrator and greenhouse simulation model. Engineering of the FC module and of the vehicle;

Month 36: Production and implementation of RES (renewable energy system) to produce hydrogen to be used in the ecobuilding and, eventually, in the national grid. Implementation of the system and personnel training;

Month 60: System verification and optimisation. Test and assessment of the mobile unit.

[19] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Workpackage description (60 month plan)

Title: Mini wind power applications

Workpackage number	4	**Start date or starting event:**		Month 1			
Participant ID	ARAEN/RA	WECO	UNIPE 1	UNIAQ	GRTN	ENEL	UNIPE 2
Person-months per participant:	5	14	2	2	1,5	1,5	1

Objectives

The project provides for the manufacturing, installation and monitoring of nr.3 mini wind mills with a nominal power each of 20kW. These applications are innovative from a project point of view and in addition are considered to be highly efficient. The total (3 wind mills) yearly production of energy will be of 111.690 kWh. The action will also include the development of a system with electrolyser for the production of hydrogen to be activated when the wind conditions are not economically profitable. The main target is to overcome the contractual and technical obstacles within the eventual connection of these mini wind power applications to the national grid.

Description of work (*indicating the role of each partner involved)*

WP 4.1 During the first 12 months an anemometer testing system will be installed in order to study and properly engineer the mini wind-mills and the validity of the connection will be assessed (GRTN). From month 4 to16, the proper and most convenient site for the installation of the mini wind-mills will be decided in order to draw-up the final installation project. From month 7 to19, all eventual issues that could create hold-ups will be dealt with. All the latter actions will be performed by the ARAEN/RA and WECO, UNIPE2, GRTN, ENEL.

WP 4.2 The implementation steps that will follow are: (months 12-21) manufacturing of the 3 mini wind-mills (WE.CO.); (months 12-23) engineering of a stand-alone wind-mill complete with an electrolyser for the production of hydrogen and oxygen (WECO, ARAEN/RA, UNIAQ, GRTN, ENEL).

WP 4.3 During the months that go from 31 through 60, verification, study and validity of the system and in detail in relation to the efficiency and the sustainability of costs (WECO, UNIAQ, UNIPE1, ARAEN/RA).

Deliverables

Month 3-6: Anemometer testing system will be installed in order to study and properly engineer the mini wind-mills and the validity of the connection will be assessed (GRTN);
Month 10: Decision on the proper and most convenient site for the installation of the mini wind-mills;
Month 16: Manufacturing of the 3 mini wind-mills;
Month 20: Study of a stand-alone wind-mill complete with an electrolyser for the production of hydrogen and oxygen;
Month 42: Verification, study and validity of the system and in detail in relation to the efficiency and the sustainability of costs.

Milestones[20] and expected results

Month 12: Study and engineering of the location site for the mini wind-mills;

Month 30: Installation of the mini wind mills and engineering of the stand-alone unit;

Month 60: Test, verification and assessment of the system.

[20] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Workpackage description (60 month plan)

Title: Biomass applications

Workpackage number	5	**Start date or starting event:**		Month 1				
Participant ID	ESCO	ARAEN/RA	AICH	UNIAQ	MUN	CISI	UNIPE1	CM
Person-months per participant:	1	10,5	4	3,5	20	1,5	3,5	2

Objectives

The project provides for the creation of a biomass integrated system within the Treste valley. Part one of the project will be performed based on optimising the valley resources. For instance, the mountainous part of the valley will supply mainly raw wood, the hilly part of the valley will supply agricultural scrap or dedicated high energy crop, while the coastal part of the valley would supply agricultural scrap and industrial wood scrap. In view of this vision, the municipalities would create each a storage point (12 sites). The local population/companies of each municipality would therefore have a storage point near their premises. Each point would be served by a mobile chipper that would transform the raw material into a transportable good. The pre-treated biomass would then be dispatched to a centralized storage point for the drying treatment, transformation into pellets and packaging. The consequent utilization in a centralized CHP station of approximately 1MW will be studied.

Description of work (*indicating the role of each partner involved)*

WP 5.1 From month 1 to 12: study and engineering of the complete biomass production/usage system seen as a chain made up of pick-up, storage, transformation, transportation and use (ARAEN/Regione Abruzzo, all municipalities, ESCO, UNIPE1, UNIAQ). Creation of a service company made up of 15 employees that will manage the biomass system. CISI will support the development of new types of applications customized for the local necessities in the field of biomass transformation.

WP 5.2 From month 13 to 20, creation of the 12 storage facilities within each municipal boundary (MUN). From month 13 to 18, purchase of the truck equipped with wood chipping unit (MUN, ARAEN/RA, CISI). From month 13 to 30, creation of the centralized storage facility necessary for the drying process and further pellet making. (ARAEN/Regione Abruzzo, all municipalities, UNIPE1, UNIAQ, CM, AICH)

WP 5.3 At last, during the last months (30-60), all necessary fine tuning and assessment will be made in order to verify validity of the system in the energy integration of the valley. (ARAEN/Regione Abruzzo, all municipalities, UNIPE1, UNIAQ, AICH)

Deliverables

Month 3: Identification of the biomass pick-up points;

Month 6: Creation of the biomass service company;

Month 12: Biomass production/usage system made up;

Month 16: Creation of the storage facilities within each municipal boundary; purchase of the truck equipped with wood chipping unit

Month 24: Creation of the centralized storage facility necessary for the drying process and further pellet making;

Month 36: Fine tuning and assessment to verify validity of the system in the energy integration of the valley.

Milestones[21] and expected results
Month 12: Study and engineering of the whole biomass production/usage system;
Month 30: Installation of all the pick-up and storage facilities including the centralized location and employment of 15 personnel;
Month 60: Test, verification and assessment of the system.

[21] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Workpackage description (60 month plan)

Title: Training and dissemination

Workpackage number	6	**Start date or starting event:**		Month 3				
Participant ID	ARAEN	H2It	Univ. AQ	Univ. PE 1	Univ. PE 2	APT		
Person-months per participant:	10	15	2,5	2,5	2,5	3,5		

Objectives

The training and dissemination activities are a focal point of the HigHville project: guided school tours in the major valley sites, the use of young soon-to-be graduated university students and stage workers that will have a direct contact with Demonstration Projects, the creation of a dedicated hydrogen center (H2 HigHville center) and the organization of several work activities between private and public partners (meetings, workshop, etc…). Their objective will be to sensitize the local population to the use of RES of to facilitate the HigHValley system.

Description of work (*indicating the role of each partner involved)*

The training and dissemination activities are directly connected to the all the projects involved in this HigHValley system and therefore will follow approximately the same timetable. Due to this, the work has been divided in single times and not as a schedule.

The visible and attractive training space easy accessible for citizens and tourists (APT, ARAEN/RA, H2IT), identified in the Cupello Eco-Building, will need additional work in order to make the space fully operational; 20 months;

Prepare information for the general public on the applications of hydrogen and fuel cells in combination with renewable energy (H2IT/Highville team); 6 months to make descriptions of all Highville projects, from there ongoing update and presentation in the H2 Highville Center; organise one annual event/fair to communicate the developments in the Highville project;

Prepare dedicated seminars to present specific market opportunities for small and medium sized companies in Abruzzo (ARAEN/RA, H2IT); 18 months to prepare material and organize first event, from there regular updates and events (Aperitivo H2 for local professionals in the sector);

Collect, maintain and make a database of local regulations regarding renewable, hydrogen and fuel cell installations available and communicate solutions of other national and international projects (H2IT/Highville team); 12 months to collect latest data, from there ongoing updates on local sites;

Collect, maintain and make available a database of national and European funding opportunities (ARAEN/RA, H2IT); 6 months to collect current programmes from there ongoing updates on local websites;

Create a database of successful hydrogen and fuel cell school projects and adapt material to local schools (H2IT, ARAEN/RA): 24 months to collect material for different grade levels, adoption to local schools and training of first teachers;

Set up a local Technical Training structure involving, local Universities, local technical schools and private companies to teach how to handle hydrogen and basic fuel cell maintenance; 18 months to prepare course material and identify locations;

Deliverables
12 months: Database financing
18 months: Educational program with trained teachers
20 months: Operational Center
24 months: Technical training program

Milestones[22] and expected results
Month 20: Completion of the H2 HigHville center;
Month 24: Database of local regulations regarding renewable, hydrogen and fuel cell installations available;
Month 36: Set up a local Technical Training structure involving, local Universities, local technical schools and private companies to teach how to handle hydrogen and basic fuel cell maintenance.

[22] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Workpackage description (60 month plan)

Title: Project Management

Workpackage number	7	**Start date or starting event:**					Month 1	
Participant ID	ARAEN							
Person-months per participant:	8							

Objectives

The project management will be divided on two levels. One will be of coordination between the local partners in the development of the demo projects. The other will be the coordination between ARAEN/RA and the project coordinator (Norsk Hydro) and the other European partners.

ARAEN will supervise the entire project as local coordinators in accordance with a developed organization:

ARAEN / Regione Abruzzo

WP Consultant		WP Consultant		WP Consultant		WP Consultant		WP Consultant		WP Consultant	
WP1		WP2		WP3		WP4		WP5		WP6	
1	CIV	1	WES	1	COS	1	WECO	1	MUN	1	H2IT
2	APR	2	ENEL	2	AIRL	2	GRTN	2	AICH	2	APT
3	UNIAQ	3	UNIPE2	3	UNIAQ	3	UNIPE1	3	UNIAQ		

Since the complexity of the projects require the active participation of regional, national, public and private actors, high professionalism and costly financial resources, it would be recommended to use a team of 2/3 as Project Management. The team would have the responsibility to carry on the individual project and activate all possible means in order to fullfill the required tasks through an efficient management system. Each Project Management Team would in turn be coordinated by an external consultant that would be considered as the Project Director. Each Project Director would then be the liaison between each individual project and the Local Project Coordinator (ARAEN / Regione Abruzzo).

In addition, each single project will have a cost analysis committee (at zero cost) made up of representatives of each partner involved in each single project. This in order to evaluate and control the correct cost of the single projects (in general).

Description of work (*indicating the role of each partner involved)*

7.1 During the first 3 months we will identify and nominate the individuals (or companies) involved as specific project coordinators (team) and the individuals that will make up the cost control committee. After the single projects are operationally defined (12 months), through a strict selection, we will identify the individual (or company) that will act as specific project director. ARAEN/RA will coordinate through regular meetings with the six project directors approximately every 4 months to set the updated situation of each project. During these meeting, apart from the technical aspects, all participants will also report on the administrative, accounting and financial situation of the single projects. During the first year we will create a network, that will operate via internet, made up of all the partners of the project to facilitate exchange of information, data and to have a window open to the interests of the local population, students, SME's etc…

7.2 The relations between ARAEN/RA and the European Project Coordinator and the other European partners will be dealt with in accordance with the timing and procedures dictated by the project. There will be a continuous information flow between ourselves, the Project Coordinator and the other European project partners.

Deliverables

Month 3: Creation of the local project management structure;

Month 12: Identification of the Project Directors;

Month 14: Creation of the local web network.

Milestones[23] and expected results

Month 3: Creation of the local project management structure;

Month 12: Identification of the Project Directors;

Month 14: Creation of the local web network.

[23] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

Workpackage description (60 month plan)

Title: Accompanying studies

Workpackage number	8	**Start date or starting event:**				Month 1		
Participant ID	UNIAQ	UNIPE1	UNIPE2	UNIBA	UNIFE			
Person-months per participant:	-	-	-	-	-			

Objectives

Each research institute, which in our case are 5 Universities, will produce all the necessary accompanying studies that will be, in any case, integrated directly within each single and specific project. All the performed studies will be then available for repeatability and will go into a centralized data base.

Description of work (*indicating the role of each partner involved)*

See projects (WP 1 through 6).

Deliverables

See projects (WP 1 through 6).

Milestones[24] and expected results

See projects (WP 1 through 6).

[24] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

B.9 Other issues

If there are ethical issues associated with the subject of the proposal, show that they have been adequately taken into account - indicate which national and international regulations are applicable and explain how they will be respected. Explore potential ethical aspects of the implementation of project results. Are there other EC-policy related issues, and are they taken into account? Demonstrate a readiness to engage with actors beyond the research to help spread awareness and knowledge and to explore the wider societal implications of the proposed work; if relevant set out synergies with education at all levels. (No recommended length – depends on the number of such other issues linked with the project)

With reference to the "Ethical rules for FP6 projects" as referred to in the guide for proposers, page 45, there are no ethical issues associated with the subject of the proposal. The subject sustainable energy communities are not mentioned as an ethical issue in either of the following:

- National legislation in the participating countries
- EU legislation
- International conventions and declarations (Kyoto protocol)
- Opinion of the European Group on Ethics
- Amsterdam protocol on animal protection

However, as an annex to the consortium agreement, each partner in the HIGHVILLE consortium will be requested to provide a copy of their ethical guidelines if so exists (see copy of IFEs Ethical guidelines and basic values as an example in annex B.9)

B.10 Gender issues

B.10.1 Gender Action plan.

Write an action plan indicating actions and activities that will be developed to promote gender equality in all forms within your project. (Recommended length - one page: for further explanation see Annex 4).

The basic instrument in the HIGHVILLE project for ensuring appropriate attention to the planning processes in the local communities is the HIGHVILLE model. The HIGHVILLE model will be further developed and tested out during in all phases of the project. New elements can easily be added to the assessment criteria, and the development of appropriate performance indicators is one key activity under the WP 4.2.

Based on the above, the HIGHVILLE project will integrate the following actions in the management structure and the work plan to in order to promote gender equality:

1. The HIGHVILLE project will aim at having gender equality in the project core team.
2. The HIGHVILLE project will aim at promoting gender equality within the local planning processes by including the gender issue as one performance indicator in the HIGHVILLE model.

B.10.2 Gender issues.

If there are gender issues associated with the subject of the

proposal, show how they have been adequately taken into account. (Recommended length - one page).

With reference to the "Gender dimension for FP6 projects" as referred to in the guide for proposers, page 48, the gender issue is referred to as relevant in both the design and development of sustainable technologies as well as relationships between citizens and institutions in Europe. As the HIGHVILLE project addresses both the technology and the society dimensions of sustainability in local energy communities, the gender issue is particularly relevant for the HIGHVILLE project. As referred to in the descrition of the Gender action Plan, the HIGHVILLE project consortium will therefore take the gender dimension into account through the design of the HIGHVILLE project management structure. The following elements are foreseen in this respect:

1. Firstly, the coordinator Norsk Hydro will assign a project director for the overall management of the project. The process of identifying and assigning this person is under the supervision and responsibility of Mrs. Hilde Myrberg, Director for the department of Renewable Energy and Hydrogen in Norsk Hydro. Her involvement will ensure an appropriate gender attention to this process.
2. Secondly, the HIGHVILLE project was initiated and developed by Mrs. Elisabeth Fjermestad Hagen. Her involvement and dedication has influenced the overall approach to the mix of technology and society focus. It is foreseen that Mrs Fjermestad Hagen will play an active role in the implementation as a member of the HIGHVILLE Steering Committee.
3. nn
4. nn

B.11 Annexes – Demonstration sites

B.11.1 Demonstration site – Middlehaven, Middlesbrough

B.11.2 Demonstration site - Ærø

B.11.3 Demonstration site – Abruzzo region

B.11.4 Demonstration site – Western Isles

B.11.5 Demonstration site – Miljøbyen Grenland

B.12 Annexes – Additional partner information

B.12.1 Ethical Guidelines and basic values – Institute for Energy Technology

http://intranet.ife.no/IFE/Personal/etikk-eng.pdf