

## Summary long

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## 1. Introduction

C2CI project intends to use innovative Cradle to Cradle (C2C) concept in relation to islands, which is a new way to sustainability. C2C concept has been developed by Michael Braungart and William McDonough who criticize the current way of thinking about saving environmental degradation by reducing, re-using and recycling products, which makes products 'less bad'. In their vision this only leads to more waste and pollution but over a longer period of time. In C2C vision making 'less bad' products has to be switched by designing intelligent products and materials, that can be used over and over again in biological or technical cycles. This means that all materials used can provide "nutrition" for nature and industry, and maximize material value and safeguard ecosystems. Every product ingredient has to be designed to be safe and beneficial; to naturally biodegrade and restore the soil or to provide high quality resources for the next generation of products. In this vision the concept of waste doesn't exist anymore: 'waste=food'.<sup>1</sup> Large companies, like in the Netherlands Philips, the chemical company DSM and the waste company van Gansewinkel and others, are starting to see the economical and environmental potential of these ideas and manufacture products that are C2C and construct buildings according to C2C principles. The project will run from 1 January 2009 to 1 July 2012.

### 1.1 Rationale

The islands in the North Sea Region are facing many common problems: geographical isolation, a lack of local resources (energy, materials, water supply), high tourism pressure on resources and the environment by tourists, and declining populations. The new and revolutionary 'cradle to cradle' (C2C) concept will be applied to achieve energy efficient sustainable development as regards to the supply of energy, and the energy implications of water and materials on islands.

The project considers the lack of resources on islands and strives to find sustainable strategies and solutions to meet these resource difficulties. Goods, food, energy and materials usually have to be transported in, mostly by ship, making it harder to provide islands with the necessary resources. The pressure on resources is particularly high in the season, when visitors outnumber significantly the island population. New innovative techniques are required to sustain communities, many of which are suffering depopulation as a result of the well recognised spiral of decline, while others are failing to produce sustainable and resource efficient solutions to improving tourism activities.

By applying the C2C concept islands associate with the worldwide trend for more sustainability, and they will profit from the economical chances this concept will offer. At the same time islands are excellent labs for experimenting with new technologies, thus being a catalyst for innovation. The outcomes can directly be applied on the islands themselves, but can also be transferred to the North Sea Region area as a whole and even far beyond.

The project will be carried out by a partnership of six countries, led by the province of Fryslân. Clusters will be formed around the issues of energy, water and materials, all of them applying the C2C concept. The

<sup>1</sup> William McDonough and Michael Braungart (2002) *Cradle to Cradle: Remaking the Way We Make Things*; North Point Press, New York, First edition, 2002

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German EPEA Agency (Environmental Protection and Encouragement Agency) will coach the whole project from the C2C-vision. The partnership consists of in total 22 participants from local and regional governments, knowledge institutions, waterboards and private companies from 6 North European countries. This project can be seen as a first step in an ongoing process in developing islands towards sustainability in the context of the C2C approach. It is estimated that the whole process will take a time span of thirty years.

## 2. Aim and Objectives

The overall **aim** of C2CI project is to make a substantial contribution to environmental sustainability and to stimulate economic profit of the North Sea Region by:

1. applying the 'cradle to cradle' concept to develop energy responsible and sustainable solutions for island environments
2. using islands as labs and testing grounds where research institutes and businesses can experiment with new technologies, so that innovation will be accelerated;
3. developing networks of governmental organisations, knowledge institutions, companies and other relevant stakeholders to ensure long term transferability and dissemination of ideas and concepts.

The **objectives** of the project aim at speeding up the development of new energy related technologies and strategies, increase their uptake and through partnership ensure their safe and sustainable adoption. Specifically the objectives are:

1. To investigate the demands of island communities and their visitors focusing on energy and the energy implications of other key resource issues like water and materials.
2. To develop a method of C2C implementation and apply it across all relevant energy and resource issues in each island group. This will be led by EPEA with all partners taking responsibility for their areas.
3. To create sustainable resource projects for the islands, which integrate energy concerns into spatial planning and territorial development as well as investigate applications of new forms of energy and mobility (for example solar, hydrogen, tidal and wind energy), together with innovative transport means on and to the islands.
4. To assess water resource enhancement and optimization, closing water cycles, and reduced energy consumption throughout the water cycle.
5. To design new environmentally safe materials for products and services, like design of an Eternal Island Holiday House.
6. Future implementation and dissemination of the project results:
  - a. To establish a transnational C2CI Network of governmental organisations, knowledge institutions, companies and other relevant stakeholders cooperating in clusters aiming on stimulating and facilitating the future implementation and dissemination of the C2CI approach;
  - b. To establish islands incubator centres (contact points led by the C2CI Network embedded in existing islands organisations) in order to facilitate the further implementation of the C2CI approach on the islands.

## 3. Activities and results

Activities will be developed in transnational cooperation with the project partners. For effective transnational output, which is a key element in the Interreg IVB NSR program (underlining joint actions for successful implementation of the project), partners will cooperate more actively in one or more so called themes of which three will be established from the start of the project. The three themes are: *Energy/Mobility*, *Water* and *Materials*. All the outcomes of the themes will be shared continuously with the other partners.

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- *Theme Energy/Mobility* will be led by TU Delft (NL) in cooperation with the University of Aalborg (DK). The other partners are: Pure Energy Center/Shetlands (UK), Province of Fryslân (NL), Wetsus (NL), Insel- und Halligkonferenz/Region Uthlande (D), Spiekeroog (D), University of Zeeland (NL), Samsø (DK), Tjörn (SE) and Norddjurs Municipality/Anholt (DK).
- *Theme Water* will be led by Wetsus (NL). The other partners are: Vitens (NL), OOWV (D) in cooperation with Spiekeroog (D), IRRRI (UK), Ameland (NL), Frisian Waterboard/Wetterskip Fryslân (NL).
- *Theme Materials* will be led by EPEA (D). The other partners are: TU Delft (NL), Insel- und Halligkonferenz/Region Uthlande (D), Island of Runde (NO), University of Zeeland (NL), Island Storvagan (NO).

The next **activities** are to be realized during the project:

1. Investigation of the islands' demands and opportunities (University of Aalborg)
2. Development of a method of C2C implementation for the islands (EPEA)
3. C2C resource projects:

### *Theme Energy/mobility*

- a. Testing and applying the concept of 'blue energy' (mixing salt water and fresh water in order to produce electricity) for island environments
- b. Investigate the increased use and feasibility of renewable energy sources like solar, wind, wave and tidal energy (maximize use of )
- c. Designing and testing sustainable product services for island mobility, e.g. electric scooter concept and electric tuk-tuk
- d. Optimizing sustainable transport between and on the islands
- e. Link energy savings with the modernisation of housing

### *Theme Water:*

- a. Sustainable supply of drinking water by desalination of sea water
- b. Sanitation and separation of household water in several streams
- c. Purification and re-use of the effluent of waste water treatment plants
- d. Storage of rainwater underground during winter times to realize sustainable water supply in summer

### *Theme Materials:*

- a. Design of an Eternal Island Holiday House: energy producing, made with local materials, transportable and degradable
- b. Set up of an innovative Research Centre on Biopolymers to adapt for instance environment polluting plastics into new in water dissolvable environmental friendly products and to make use of local available resources like algae
- c. Local production with these innovative materials, e.g. tourist products like custom tailored swim suits, toys for kids etc.
- d. C2C solutions for the local marinas and surrounding buildings

## 4. Dissemination and capitalisation activities

- a. The Lead Partner Fryslân will take the initiative to establish a transnational C2CI Network of governmental organisations, knowledge institutions, companies and other relevant stakeholders.
- b. As a part of each transnational meeting activities and task of this Network will be discussed and developed, resulting in an operational network that will further implement and disseminate project results.

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- c. The set up of incubator centres on the islands.
- d. Use the project results for publicity and education (press articles, involvement of schools).

## Expected results:

- Islands have become catalysts for new developments and testing ground for sustainable innovations
- C2C methodology for islands developed
- Results of pilot projects in the field of energy, energy/water and energy/materials
- Incubator centres on the partner islands, aimed at further development and implementation
- Transnational network of governmental organisations, knowledge institutions, companies and other relevant stakeholders cooperating in clusters with the following aims:
  - a) Transfer of the project results to other islands in the North Sea region and to transnational networks on political, scientific and implementation level in and outside the North Sea region;
  - b) International exchange of the practical project knowledge about research, new products and applications;
  - c) To assist the established incubator centres;
  - d) To initiate and facilitate the project results implementation process including the search for funding.

The C2CI Network of island governments, knowledge institutions and businesses will progress their work on sustainable development for the islands. The incubator centres will play a key role in spreading the results further after the project to island populations, visitors, governments and companies. Investments are foreseen for the realisation of more C2C products that are beyond the scope of the project. During the project investors will be already interested to commercialise products after the project ends. Furthermore on the basis of the gained results new projects will be developed as a next step in the ongoing process of becoming fully sustainable and C2C islands with local, regional, national or EU funding. E.g. for follow up activities on the Wadden Islands funding will be sought in the Interreg IVA programme for cross-border cooperation between Germany and the Netherlands.

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