



**ECO-INNOVATION**  
WHEN BUSINESS MEETS THE ENVIRONMENT

**CIP Eco-innovation  
Pilot and market replication projects  
Call 2012**

**Call Identifier: CIP-EIP-Eco-Innovation-2012**

**Interim Report  
EcoPonics  
Contract ECO/12/332783/SI2.656985**

**Covering the reporting period from  
18/07/2013 to 17/02/2015**

**Reporting Date  
12/03/2015**

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**Project website: <http://aquaponics.is/ecoponics/>**

## **Progress of work plan in the period**

### **1.1 General progress (max half page) - Summarise the objectives and the achievements, deviations, important problems and difficulties met.**

The project has run well and the project consortium has had a good collaboration spirit from start. The project has been presented widely towards the industries, R&D environment and governmental institutions. The aquaponics network has been strengthened substantially through active participation in international collaboration networks and presentations of EcoPonics at conferences, seminars, journals and public media. The three SMEs, Breen in Spain, IGFF in Denmark and Svinna in Iceland have developed their aquaponics systems towards commercial production. Breen has built a new hatchery in Tknika and started operation and is increasing the production area. The company has been focusing on the future expansion and design of commercial production units with zero waste. This has included analysing alternative protein sources for the feed. IGFF established in August 2014 a 60 m<sup>2</sup> modern industrial based aquaponic test system. Mobile plant tables covers the fish tanks utilizing 'economies of space', and the horticultural production is done in pots with soil hence accepted for organic certification. It came into full operation in December 2014 with already sales trials of herbs every 2 weeks to operationalize a commercial driven production management. Likewise, scientific based modelling on the IGFF aquaponic production system has been completed, documenting energy savings of 21%, and CO<sub>2</sub> contributions from fish boosting plant production with 14% compared to conventional greenhouse production. Svinna imported Nile tilapia from Fishgen UK in August and December 2013 and has built and operated the first aquaponics pilot units since January 2014, testing different plant species and developing the future design and business plan. Test products, mainly fresh salad and herbs and dried herbs have been presented and a product logo has been designed.

### **1.2 Progress on all work packages against initial objectives – *Compare in a few lines the activities planned (based on Annex I of the Grant Agreement and the previous report) to the progress made, work package by work package; state of purchase of equipment; identify partners involved, including their roles; describe major subcontractors, stakeholders, etc. involved. Also assess in the table below the deliverables listed in Annex I of the Grant Agreement which correspond to the present reporting period.***

## **WP1: Project management**

The project had a good start and has been running well. The consortium works well as a team and EcoPonics has been well presented. The communication within the consortium has mainly been through e-mail and skype and internal project information and documents are stored and distributed via the project dropbox.

Five physical meetings have taken place, the first in September 2013 visiting aquaponics entrepreneurs in Norway, the second meeting was held in Iceland in combination with an aquaponics seminar in Iceland on March 25<sup>th</sup> 2014, the third meeting was held in San Sebastian in Spain in connection with an international congress on vocational education,

competitiveness and employment in May 2014 held by the Basque government, the fourth meeting was held in San Sebastian in relation to the Aquaculture Europe 2014 congress in October 2014 including presentations of the projects results in the special aquaponics session at the conference, at Breen's business stand and during several visits of stakeholders and other interested groups to Breen and Tknika. The fifth meeting was held in Grimstad Norway in November 2014 where the main results of EcoPonics were presented at the aquaponics seminar held by Bioforsk. A Leonardo funded vocational training programme on aquaponics was started in collaboration with Bioforsk, thus the group has worked closely with Bioforsk and been able to have physical meetings more often than planned. Furthermore, part of the group has met twice on aquaponics meetings within the European Science Foundation (ESF) and the COST Action on aquaponics. The next EcoPonics meeting is planned in Copenhagen Denmark on March 16<sup>th</sup> 2015 back to back with a Leonardo aquaponics seminar on March 17<sup>th</sup>.

The progress report (D1.1) was delivered June 12<sup>th</sup> 2014.

## **WP2: Upscaling and optimization of BREEN Technology**

The main tasks of WP2 include an optimal design of the commercial plant, taking into account optimal harvesting at least once a week all-year round, driven by the market need. Focus is on environmentally friendly production and full use of all resources. The key to this is a healthy and balanced polyculture system. Thus, the feed is 100% based on sustainable ingredients, no synthetic fertilizers are used for the plant production and no effluent water or waste leave any of the production units.

During the first period of the EcoPonics project efforts have been focused on design and construction of the hatchery and aquaponics units at the new location at Tknika. The new units were ready in the beginning of 2014 and have been running since. Furthermore, Breen has carried out investigations on available fish feed formula and alternative protein sources.

The new site is located at Tknika, a centre promoted by the Basque Department of Education, Universities & Research. It is under the direct auspices of the Sub-Department of Vocational Training & Lifelong Learning. Innovation is at the core of Tknika in its ongoing efforts to place Basque Vocational Training at the European forefront.

Tknika provides their installations and buildings to develop Breens aquaponics. There are very good space for the production units, as well as a laboratory and a hatchery. Emphasis is on sustainable energy use such as biomass heating and solar energy.

Tknika has offered BREEN more space than they assigned at the beginning of the project. Thus, it will be possible to expand further and improve the installations.

### **Equipment:**

The construction of the installations were finished in the beginning of 2014; the main costs incurred until now and the main suppliers, are:

- Construcciones Iñadi, working in the indoor installation of the hatchery:

- Fish tanks
- Hatchery fish tanks
- Mechanical filtering system
- Water and heating system for production
- Aquaponics tanks design and CAM (Computer-aided manufacturing)
- Installation of RAS and heat (recirculating aquaculture system)
- PcComponentes, computers and components for the control system, in the Check Office.
- Coralleida, profilux control system

The following tasks and installations have been carried out:

In the Hatchery:

- Recirculation and filtering pumps
- Water recirculation system
- Heating system of the water
- Thermal management system
- Aeration system of the water
- Breed Tanks
- Vegetal filtering system
- Controlled artificial lighting for plant growth

Control and handling of products:

- Laboratory for the monitoring of the quality of the feed
- Room for the handling of broodstock

Other:

- Junior and Senior Expert Office
- Control office
- Feed store

IGG has provided assistance with economic analysis and Svinna has provided assistance with reports on environmental parameters and risk analysis.

D2.1 was delivered by Breen June 12<sup>th</sup> 2014 and is resubmitted now together with D2.2 and D2.3.

### **WP3: Smart Eco System management and urban food production**

A 60 m<sup>2</sup> modern industrial based aquaponic test plant has been established by IGFF in August 2014. The test plant is placed in a greenhouse facility designed for research and innovation, and owned by Copenhagen University and managed by the Danish Research and Innovation Center: AgroTech Ltd. IGFF rents the space for its aquaponic trials. In December 2014 it was up and running in full operation, and commencing sale trials of various herbs taking place

every two weeks for optimizing operational management. Three types of fish are on trial: red tilapia for sale as a whole fish, silver tilapia for filleting, and pike perch for whole fish sale. A consumer study has been commenced with an urban food network in Copenhagen having 1,500 members on preferences for fish delivery at the demand side.

Since June 2014 meetings between IGFF and the Danish Agriculture & Food Council (DAFC) / Organic Division have been taking place on the prospects of obtaining an organic certification within aquaponics. Since the IGFF Urban production system grows its plants in soil it has been confirmed, there are no problems in getting the horticultural products certified organic. The challenge is the fish production, which at present collides with the EU rules for organic fish production. DAFC discusses with its organic industry members in February 2015 if there should be a political initiative to push for changes in the EU organic rules so aquaponics can be certified as an organic production system.

IGFF and AgroTech have developed a scientific model for analysing energy and CO<sub>2</sub> consumption in aquaponics and the first estimations have been made. A conference paper with the results was completed in October 2014, documenting energy savings of 21%, and CO<sub>2</sub> from the fish contributing to a 14% higher growth yield in the plants, compared to a conventional horticultural production with the same technological specificities. The IGFF/Agrotech model and its physical measurements on energy and CO<sub>2</sub> in a 1,000 m<sup>2</sup> modern industrial aquaponic production system as a baseline, are at present being made into a scientific paper with a complete 'Contribution margin accounting' comprising both the variable cost savings on CO<sub>2</sub> and energy as well as the fixed cost savings in the IGFF production design.

The aquaculture production system has been provided by the aquaculture company Akvagroup Ltd. Together with IGFF a new mobile legging system was developed so the plant tables could stay mobile above the fish tanks. Likewise, Akvagroup Ltd supplied the piping and electronic operational system connecting their aquaculture equipment with the horticulture production, hence managing the whole aquaponic production in an optimal way. Profilux has supplied the electronic surveillance system for both alarm as well as data monitoring for scientific trials once the aquaponic system is in a biological steady state. Negotiations with DTU-aqua has commenced for using the 60 m<sup>2</sup> test plant to MSc and/or PhD students interested in making trails on RAS-systems. Negotiations will also commence with Copenhagen University on the prospects of using the test plant for MSc and/or PhD students working within industrial horticulture.

Breen has provided know-how about technology development and the implementation of the surveillance system from Profilux and Svinna has been involved in discussions about policies, regulations and organic standard requirements affecting aquaponics.

D3.1 was delivered by IGFF June 12<sup>th</sup> 2014 and is resubmitted now together with D3.2.

#### **WP4: Renewable energy for food production with geothermal aquaponics**

The first pilot units were constructed by Svinna and HI based on a relatively simple design while building up knowledge and skills of operating the recirculation system and keeping it in a healthy balance. The start-up process has included a learning process joining skills and knowledge from the different fields of aquaponics, such as keeping the environmental

parameters stable, choosing suitable plants, breeding tilapia, improving the efficiency in the overall system and marketing issues including regulations and certification criteria. Tilapia was imported from Fishgen UK and the survival and growth has been good. A wide range of different plant species have been tested, both fruity plants as cucumber, tomato, pepper, strawberries, okra and aubergine and leafy greens such as salad, basil, mint, dill and coriander. It has been concluded that tilapia and leafy greens suit best for environmental and economic benefits. The feed conversion ratio was measured below 1 and the mass balance of herbs:fish was found  $>1$ . The surveillance has been based on monitoring temperature, pH, electrical conductivity (EC), total dissolved solids (TDS), dissolved oxygen (DO), carbon dioxide ( $\text{CO}_2$ ), iron (Fe), ammonia, nitrite, nitrate and phosphorus. Online monitoring has been limited to an aquarium system from SENEYE and not yet with Profilux used by Breen and IGFF as this system is to be compared with additions to greenhouse surveillance systems before being bought also in Iceland. The equipment cost in WP4 so far is less than planned, but will increase during 2015 with further development towards commercialisation.

The aquaponics technology is developing in several European countries as the interest from the R&D environment as well as the industries is increasing. In simple aquaponics setups there is a trade-off between the optimum environment for the fish and for the plants, respectively, as the optimum environment for tilapia is at higher temperature and pH than the optimum conditions for the plants. This is solved in so-called decoupled systems securing optimum conditions for both the plants and the fish. Also decoupled systems will open up for cold water species such as rainbow trout and Arctic charr. Based on the results so far it has been concluded that the future development of large scale aquaponics production systems will most likely be based on decoupled systems relying on the latest development within Recirculation Aquaculture Systems (RAS). IGFF has established a collaboration with AkvaGroup in Denmark one of the main supplier of modern RAS systems and is looking further into how this development can be used in aquaponics in WP3. Thus, the results from the decoupled system at IGFF in WP3 will also be taken into account for the future development of large production units by Svinna. However, such systems have a much higher capital cost.

Certification and marketing issues related to aquaponics and organic production have been discussed with certification specialists and organic farmers. Furthermore, the project has been presented to other businesses both in aquaculture and horticulture, to research partners, several municipalities in Iceland and governmental bodies.

A risk analysis has been carried out pointing out the main risks in an integrated aquaponics production system and how these can be minimized. The results show that monitoring and controlling the crucial environmental parameters is essential to maintain a healthy and stable system. The main risk parameters are shown in Table 1.

D4.1 was delivered by Svinna June 12<sup>th</sup> 2014 and is resubmitted now together with D4.2 and D4.3.

**Table 1: Risk analysis for aquaponics**

<b>Risk</b>	<b>Probability</b>	<b>Severeness</b>	<b>Contingency plan</b>
<b>Fish disease</b>	Low	Medium	Strict management procedures, dividing production systems into units, controlling and keeping a healthy environment and cleaning tanks between stocking
<b>Plant pest</b>	Low	Medium	Strict management procedures, organic defences
<b>Failure of temperature control</b>	Low	High	Online monitoring and automatic control with alarm system
<b>Oxygen level too low</b>	Low	High	Monitoring and control
<b>Failure of pH control</b>	Low	High	Monitoring and control
<b>Sodium levels too high</b>	Low	Medium	Monitoring and control
<b>Failure of EC control</b>	Low	Medium	Monitoring and control
<b>Contamination of water</b>	Low	Medium	Monitoring and control
<b>Marketing failure</b>	Low	High	Keeping good quality, fulfil official requirements, and inform consumers about the production processes
<b>Extreme weather conditions, earthquakes, volcanic eruption</b>	Very low	High	Initiate emergency plan minimizing losses

Breen has provided know-how on technology and implementation of surveillance system and IGFF has been involved in the discussions about future design of decoupled aquaponics systems and the marketing aspects. HI has provided assistance on the technological and design issues, the pilot unit setup, operation and surveillance and mass balance calculations. The Agricultural University of Iceland has provided advice on choosing plants and knowledge and skills about the optimum environmental parameters for the plant part. The aquaculture specialists at Fishgen, Haukamyri and Menja have provided advice on the breeding of tilapia and design and building of the aquaculture part of the aquaponics systems.

### **WP5: Exploitation and Business Plan**

WP5 has not formally started.

### **WP6: Dissemination Activities**

EcoPonics and the project results have been presented widely, locally and internationally, both at congresses and seminars and in public media, including radio and newspapers. Also the aquaponics sites in all three countries have received many visitors. Moreover, the project has been presented towards government, municipalities, aquaculture and horticulture businesses. Also, the project consortium has broadened its global aquaponics network by active participation in international aquaponics networks. A project website has been designed and operated, <http://aquaponics.is/ecoaponics>, where public information and news about the project and its progress is presented. A logo for the project was designed and furthermore, corporate logos for the new installation by BREEN and for Svinna, respectively have been designed for improved marketing of their aquaponics.

The three SMEs have designed, built and operated aquaponics units in the respective countries and built a strong aquaponics network through participation in vocational training networks, ESF meetings, the COST-Action FA1305 - *The EU Aquaponics Hub - Realising Sustainable Integrated Fish and Vegetable Production for the EU*, the established Association of Commercial Aquaponics Producers (ACAP) and by local seminars, meetings and training programmes in the respective countries joining people with interest in the field of aquaponics.

The main presentations in public media, handout materials, seminars/conferences and industry journals (D6.8) are listed in annex C and on the EcoPonics website.

D6.1, D6.6, D6.7 and D.6.8 were delivered with the progress report in June 2014 and D6.1 and D6.8 are updated and included in the annexes of this interim report.



Del. N <sup>o</sup> 1	Deliverable name <sup>1</sup>	Type <sup>1</sup>	WP N <sup>o</sup> 1	Delivery date from Annex I <sup>1</sup>	Delivered (yes/no) and status (draft/final)	Submission with report <sup>2</sup>	Forecasted delivery date	Comments on progress
D6.1	Project information updates	Project information sheet	6	M1	yes – updated regularly	PR1 and IR	12/6/2014 and 12/3/2015	According to plan
D6.7	Project dropbox	Internal website	6	M1	yes – updated regularly	PR1	12/6/2014	According to plan
D6.6	Project Website	Website	6	M6	yes – updated regularly	PR1	12/6/2014	According to plan
D6.8	Presentations in public media, handout materials, seminars/conferences and industry journals	Presentations	6	Regularly	Yes / see list in Annex C	PR1 and IR	12/6/2014 and 12/3/2015	According to plan
D2.1	Report on technical advancement and difficulties met	Report	2	M8	yes - final	PR1 and IR	12/6/2014 and 12/3/2015	Resubmitted according to e-mail reference A2261638 26/6/2014
D3.1	Report on technical advancement and difficulties met	Report	3	M8	yes - final	PR1 and IR	12/6/2014 and 12/3/2015	Resubmitted according to e-mail reference A2261638 26/6/2014
D4.1	Report on technical advancement and difficulties met	Report	4	M8	yes - final	PR1 and IR	12/6/2014 and 12/3/2015	Resubmitted according to e-mail reference A2261638 26/6/2014
D1.1	Progress report	Report	1	M10	yes - final	PR1	12/6/2014	According to plan
D4.2	Starting up production – report on design	Report	4	M10	yes - final	IR	12/3/2015	According to plan

D2.2	Report on environmental parameters	Report	2	M14	yes - final	IR	12/3/2015	According to plan
D2.3	Report on design and risk analysis	Report	2	M18	yes - final	IR	12/3/2015	According to plan
D3.2	Starting up production – report on design	Report	3	M18	yes - final	IR	12/3/2015	According to plan
D4.3	Fresh vegetables for local markets	Vegetables	4	M18	yes - final	IR	12/3/2015	According to plan
D1.2	Interim report	Report	1	M19	yes - final	IR	12/3/2015	According to plan

1.3 Identified deviations, problems and corrective actions taken in the period – *If any, identify the nature and the reason for the deviation or encountered problems (technical, financial or organisational), identify partners involved, clarify impacts on the activities and deliverables, present the strategy to overcome them; in case of deviations described in the last report describe how you have managed to get back on track.*

WP3: Some disagreements came up in Denmark on sharing costs and risks between IGFF and Ballerup municipality. The problem was solved as Copenhagen municipality offered collaboration related to Urban Demo farms, green roofs and job creation. This has neither affected the time schedule considerably nor the budget plan of the project.

WP4: It was difficult to manage the first steps of aquaponics development far from Reykjavik where the university students and others involved in the project live. This was solved by putting up aquaponics systems in a greenhouse in Reykjavik for the development process with simple movable setups and monitoring systems while building up skills and knowledge about aquaponics. Therefore, the expected budget of equipment and operation has not been fully used. However, the plan is to continue the future expansion during spring 2015 based on the obtained results.

1.4 Progress regarding performance indicators – *Assess performance indicators listed in Annex I of the Grant Agreement against impacts of the action achieved so far. Please update the excel table of the Annex II attached to the Grant Agreement.*

The units built are closed-loop zero waste systems and all nutrients are fully used. No CO<sub>2</sub> is added to the plant system and no waste-water is taken out from the system. The heating is based on direct use of renewable energy and waste heat. In Denmark district heating is used. No synthetic fertilizers are used, other than calcium carbonate and hydroxides for pH control and to add necessary Ca and K for the plants. Furthermore Fe-chelate is added to provide necessary iron to the plants. The first energy and mass balance calculations have been carried out showing the production ratio between plant and fish and the feed conversion ratio.

The excel table with performance indicators based on Breen technology remains unchanged.

IGFF has estimated the progress regarding the environmental performance indicators in collaboration with Agrotech in Denmark. From the IGFF & AgroTech modelling on the symbiotic effects in the IGFF aquaponic system the following reductions on CO<sub>2</sub> emissions and energy based on the synergy effect from the fish were measured per m<sup>2</sup> greenhouse/ year:

- CO<sub>2</sub> from fish: 2.54 kg CO<sub>2</sub>
- Energy reduction for heating due to fish tanks operating as heating buffers: 0.22 GJ

*If the energy supply is based on natural gas, the CO<sub>2</sub> emission would be 57.2 kg/ GJ.*

*The savings in CO<sub>2</sub> from heating the greenhouse in an aquaponic system would then be: 57.2 kg/GJ X 0.22 GJ/ m<sup>2</sup> = 12.6 kg CO<sub>2</sub>/ m<sup>2</sup>/ year*

*Total reductions in CO<sub>2</sub> emissions would be: 12.6 kg CO<sub>2</sub> + 2.54 kg CO<sub>2</sub>= 15.14 kg CO<sub>2</sub>/ m<sup>2</sup> greenhouse/ year*

Reduction in water usage in the aquaponic system is estimated to be 4.5 m<sup>3</sup> compared to a modern RAS system (Recirculating Aquaculture System), and 49.5 m<sup>3</sup> if compared to an open pond.

Table 2 shows the environmental indicators in the IGFF & AgroTech modelling on the symbiotic effects in the IGFF aquaponic system and their absolute impact.

**Table 2: Environmental indicators in IGFF aquaponic system**

Objective	Indicators	Absolute impact
Improved environmental performance ( <b>REDUCTIONS</b> )	CO <sub>2</sub>	15,2 kg CO <sub>2</sub> / m <sup>2</sup> greenhouse/year
Better use of natural resources	Water	0.5 m <sup>3</sup> / kg fish produced
	Energy	0.86 GJ/ m <sup>2</sup> greenhouse/ year
	CO <sub>2</sub> (from fish to plants)	14% higher yields or 6 kg yield increase/ m <sup>2</sup> / year

**2 Progress regarding market uptake and exploitation** – *remember that Eco-Innovation aims to multiply the impacts of the projects' solutions and mobilise a wide market uptake, reaching a critical mass during the project and in the short to medium term. Describe here your progress to achieve these objectives.*

EcoPonics market uptake and exploitation work will formally start in month 23 according to the time plan. However, the consortium has been very active in presenting the business idea to aquaculture, horticulture and organic farmers as well as to municipalities, public administration and the general public. Also the consortium members are actively participating in European networks on aquaponics and have established the Association of Commercial Aquaponics Producers (ACAP). Furthermore, the project has been well presented internationally e.g. at the Aquaculture Europe conference in San Sebastian, Spain, October 14-17 2014, at Leonardo seminars and at COST and ESF meetings during 2014.

### 3 Work plan for the next period (max 1 page)

#### 3.1 Planned activities in the next period – *Give an outlook on planned activities for the period until the next report (on-going work packages, tasks per partner, due deliverables), consider any strategy developed in section 1.3)*

Breen will further expand its aquaponics production during 2015 see <https://www.youtube.com/watch?v=rApbKaWB8Ug>. This will also include a show-room and aquaponics store. During the last period of the project Breen will also realize the reports D2.4 on mass and energy balances, environmental indicators and optimized fish:plant production ratio, and D2.5 on LCA, economic analysis and cost-benefit analysis.

Breen is leading WP5 formally starting in month 23 focusing on aquaponics business replication including the marketing of the aquaponics modules developed and built in the EcoPonics project. This includes deliverables D5.1-D5.6 on cluster network, solutions to market barriers, a business plan for aquaponics business replication and a plan for exploitation and replication, a strategy advice for governments and municipalities for local sustainable food production and presentation of products to distributors.

IGFF will commence establishing the urban aquaponic roof top farm during 2015 based among several on the experiences from the 60 m<sup>2</sup> test plant operating at present as research- and trial unit for IGFF. Engineers will complete in February 2015 the first draft of the costs of constructing a frame for carrying a 600 m<sup>2</sup> roof top farm. A tender on the construction will be made during spring 2015. IGFF has already established contact with a large commercial horticultural organic producer for cooperation on aquaponic production and sales, where the urban roof top farm will be included, hence making it easier to complete a serious business plan and market uptake once production is commencing. D3.3-D3.8 focusing on urban ecology and closed loop food production will be operationalized in these activities.

Svinna will work towards commercialisation of aquaponics in Iceland, further developing the production and surveillance system in collaboration with the project partners. The project has been well presented in the media in Iceland and within the Iceland Ocean Cluster and Iceland Geothermal Cluster network. Aquaponics and its sustainable food products will be further presented and marketed to consumers and stakeholders. Svinna will work towards further innovation in the field of aquaponics, including connecting to educational and experience tourism and building a strong team of early stage researchers from different fields. The plan is to integrate the three business parts, (1) integrated production based on geothermal energy use, (2) innovative collaboration with ESRs and (3) linking to educational and experience tourism. Marketing material for the products and services (D4.4) will be further developed including recommendation for choices of species for aquaponics systems (D4.5) and operational procedures (D4.6).

Further dissemination activities will be carried out. The project will be presented at aquaponics seminars and conferences, e.g. at the aquaponics seminar to be held in Copenhagen March 17<sup>th</sup> 2015 and at the COST meeting on aquaponics to be held in Gran Canaria April 21-24 2015. Moreover, it is planned to present the results in the autumn 2015 at the Aquaculture Europe 2015 conference in Rotterdam Netherlands and/or the NordicRAS seminar in Molde Norway. The project and its progress will be presented further to the general public, industry associations, governmental institutes and researchers. Also the established and still increasing international aquaponics network will support the future development of aquaponics.

3.2 Planned meetings, activities related to market uptake and dissemination activities – *Give an overview on your planned project meetings (date, location, main topic, etc.), planned activities to foster the market uptake and dissemination activities (date, location and main topics of fairs, conferences, etc.), at least for the period until the next report.*

**Table 3: Planned meetings, activities related to market uptake and dissemination**

<b>Date</b>	<b>Location</b>	<b>Main topic</b>
20.02.15	CPH municipality/DK	Meeting with municipality on the technical results and cost calculations from engineer on the roof platform. Process on required detailing of platform design, necessary juristically actions and permits to be acquired will be decided.
23.02.15	Karlslunde/DK	Meeting on how to integrate the roof top farm as a pilot project for commercial sales and saltwater fish production as well as steps to build a 2-3.000 m <sup>2</sup> aquaponic test plant.
16.03.15	CPH/DK	EcoPonics meeting back to back with the Aquaponics seminar in Copenhagen on March 17th
20.03.15	CPH/DK	Meetings with bank presenting business plan for commercial aquaponic production
21-24.04.15	Spain	Presentations at the COST Aquaponics meeting – discussion about thresholds and regulations related to aquaponics
11/12.06.15	Iceland	EcoPonics meeting – visit from EASME
August 2015	CPH/DK	Targeting a final lay-out of aquaponic roof-top farm in agreement with CPH

		municipality
Autumn 2015	Rotterdam Netherlands and/or Molde Norway	Presentations at EAS and/or NordicRAS conferences
December/January	TBD	EcoPonics end-meeting

#### 4 Other issues (max 1 page) - *If any, indicate other issues*

Answers to remarks on the progress report according to e-mail reference A2261638 26/6/2014:

- 1) As university staff and students have been working on the project at the University of Iceland the hours of junior experts are lower at Svinna and accordingly higher at the University. The budgeted total hours for the Icelandic part remain unchanged. Some of the costs budgeted at the University such as national travel, website and monitoring have been moved to Svinna to minimize the effect on the total budget for each beneficiary.
- 2) The hours spent in Spain are higher than in Denmark and Iceland. This is according to the original plan and is due to the larger system in Spain and the fact that Breen has been operating their aquaponics units from the beginning of the project.

The pilot units in Iceland can be fully depreciated according to Icelandic regulations.

#### 5 Overview on hours spent (template downloadable from our website [http://ec.europa.eu/environment/eco-innovation/managing-projects/contract-finance/index\\_en.htm](http://ec.europa.eu/environment/eco-innovation/managing-projects/contract-finance/index_en.htm) )

Please note that details on partners hours - although recommendable - are optional.  
You may report only the total hours per Work Package

**Project Hours (Partner / Workpackage)**

ECO/12/332783/S12.656985 EcoPonics	
Reporting period	M1-M19
Deliverable	IR

Total Project Hours:	34.360,0
Total Spent Project hours:	20.408,5

Hours x Partners	WP1		WP2		WP3		WP4		WP5		WP6		WP7		WP8		WP9		Total hours x Partner	
	Annex I*	Spent**	Annex I*	Spent**	Annex I*	Spent**	Annex I*	Spent**	Annex I*	Spent**	Annex I**	Spent**	Annex I*	Spent**	Annex I*	Spent**	Annex I*	Spent**	Annex I*	Spent**
Partner 1 (Svinna)	1.200,0	920,0	200,0	125,0	200,0	142,0	6.700,0	2.192,5	500,0		300,0	284,0							9.100,0	3.663,5
Partner 2 (IGFF)	300,0	200,0	200,0	55,0	6.800,0	2.400,0	100,0	45,0	500,0		200,0	120,0							8.100,0	2.820,0
Partner 3 (Breen)	300,0	167,0	13.780,0	10.311,0	200,0	60,0	200,0	60,0	1.230,0		150,0	78,0							15.860,0	10.676,0
Partner 4 (HI)	300,0	340,0					800,0	2.519,0			200,0	390,0							1.300,0	3.249,0
Partner 5 (optional)																			0,0	0,0
Partner 6 (optional)																			0,0	0,0
Partner 7 (optional)																			0,0	0,0
Partner 8 (optional)																			0,0	0,0
Partner 9 (optional)																			0,0	0,0
Partner 10 (optional)																			0,0	0,0
Partner 11 (optional)																			0,0	0,0
Partner 12 (optional)																			0,0	0,0
<b>Total hours x WP</b>	<b>2.100,0</b>	<b>1.627,0</b>	<b>14.180,0</b>	<b>10.491,0</b>	<b>7.200,0</b>	<b>2.602,0</b>	<b>7.800,0</b>	<b>4.816,5</b>	<b>2.230,0</b>	<b>0,0</b>	<b>850,0</b>	<b>872,0</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>

% Project Hours already spent x WP (as compared to Annex I)										
	WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	
Partner 1 (Svinna)	76,7%	62,5%	71,0%	32,7%	0,0%	94,7%				
Partner 2 (IGFF)	66,7%	27,5%	35,3%	45,0%	0,0%	60,0%				
Partner 3 (Breen)	55,7%	74,8%	30,0%	30,0%	0,0%	52,0%				
Partner 4 (HI)	113,3%			314,9%		195,0%				
Partner 5 (optional)										
Partner 6 (optional)										
Partner 7 (optional)										
Partner 8 (optional)										
Partner 9 (optional)										
Partner 10 (optional)										
Partner 11 (optional)										
Partner 12 (optional)										
<b>Total % x WP</b>	<b>77,5%</b>	<b>74,0%</b>	<b>36,1%</b>	<b>61,8%</b>	<b>0,0%</b>	<b>102,6%</b>				

\* As originally proposed  
\*\* From M1 to the time of reporting.

## 6 Financial report

*The interim report has to be submitted by the coordinator in one consolidated package with the financial report and with a cover letter in which the coordinator requests the second pre-financing payment. For details on second pre-financing please consult your Grant Agreement Article I.5.2, together with Annex III. Up-to-date guidance on financial issues such as general financial guidelines, financial report or timesheets to report the time worked on the project, is available on our website [http://ec.europa.eu/environment/eco-innovation/managing-projects/contract-finance/index\\_en.htm](http://ec.europa.eu/environment/eco-innovation/managing-projects/contract-finance/index_en.htm)*

*This publication has been produced with the assistance of the European Union. The contents of this publication are the sole responsibility of Svinna, Breen, IGFF and HI and can in no way be taken to reflect the views of the European Union.*



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**Annex A – An updated version of the publishable project information sheet****Project Information Sheet****EcoFood from Aquaponics (EcoPonics)**

<b>Programme area:</b>	CIP Eco-Innovation, First Application and market replication projects
<b>Coordinator:</b>	Dr. Ragnheidur Thorarinsdottir Svinna-verkfræði ehf. (SVINNA), Iceland E-mail: svinna@svinna.is Tel: +354 8964830
<b>Partners:</b>	Breen Breeded in Green SL (BREEN), Spain Paul Rye Kledal – Institute of Global Food and Farming (IGFF), Denmark Haskoli Islands (HI), Iceland
<b>Website:</b>	www.aquaponics.is/ecoponics/
<b>Benefits (max. 150 characters incl. space):</b>	EcoPonics provides commercial Aquaponics - an environmentally friendly food production method that will be marketed for replication in Europe
<b>Keywords:</b>	Aquaponics, Sustainability, Food
<b>Sector:</b>	Green Business
<b>Type of solution</b>	Sustainable products, technology development, new service
<b>Duration:</b>	18/07/2013 – 17/01/2016
<b>Budget:</b>	€1,723,028 (EU contribution: 49.97%)
<b>Contract number:</b>	ECO/12/332783 SI2.656985

**Summary**

EcoPonics joins three innovation companies from Denmark, Iceland and Spain, respectively, collaborating with the University of Iceland with the aim to implement commercial and competitive Aquaponics production systems in all three participating countries. Aquaponics is a combination of the words aquaculture and hydroponics, and the eco-innovative technology behind is similarly a combination of the two normally specialized production systems, producing fish and plants in one production loop. The wastewater from the fish is used as resources in the horticultural production where plants take up the nutrients and hence cleanse the water before being returned to the fish, eliminating traditional use of fertilizers and minimizing use of water and energy. Thus, Aquaponics is a resource efficient and environmentally friendly food production system optimizing use of resources.

The EcoPonics partners will work towards dissemination and replication of the Aquaponics technique in Europe providing new high skilled jobs and sustainable high value food products.

**Expected and/or achieved results**

New and smarter Eco-innovative Life cycle technology solutions driven by European SME's generating commercial based industrial showcases

Integrating modern food production with EU transition policies advocating for climate resilient and CO<sub>2</sub> neutral cities

New possibilities for direct use of renewable energy in industry

New sustainable food products locally produced in Europe

Waste products made into valuables

**Annex B – Copy of the deliverables during the reporting period**

- Presentations in public media, handout material, seminars/conferences and industry journals (D6.8) – listed on the project website [http://aquaponics.is/ecoaponics/?page\\_id=215](http://aquaponics.is/ecoaponics/?page_id=215) and in Annex C
- Report on technical advancement and difficulties met (D2.1)
- Report on technical advancement and difficulties met (D3.1)
- Report on technical advancement and difficulties met (D4.1)
- Report on environmental parameters (D2.2)
- Report on design and risk analysis (D2.3)
- Starting up production – report on design (D3.2)
- Starting up production – report on design (D4.2)
- Fresh vegetables for local markets (D4.3)

## **Annex C – D6.8 Presentations in public media, handout material, seminars/conferences and industry journals**

Below are the main EcoPonics presentations during the period 18.07.2013 – 17.02.2015 listed. Further information can be found on the EcoPonics project website - [http://aquaponics.is/ecoponics/?page\\_id=215](http://aquaponics.is/ecoponics/?page_id=215)

- Interview in the local newspaper in Grimstad Norway, October 1st 2013
- Kledal, Paul Rye, Morgendagens By-landbrug [The Urban farms of Tomorrow], Grøn Hverdag no. 4/2013, pp. 16-18, 2013
- Kledal, P.R., Presentation at: 'Dyrk, Høst, Spis', [Grow, Harvest, Eat] Conference on Urban Farming and the edible city, Copenhagen October 6<sup>th</sup>
- Thorarinsdottir, R.I., Aquaponics based on geothermal energy, 2nd NordicRAS in Aalborg, Denmark, October 9-11 2013
- Thorarinsdottir, R.I., Direct use of Geothermal Energy for new businesses, presentation at the University of Iceland, November 22<sup>nd</sup> 2013
- Kledal, P.R., Presentation on 'Aquaponics & Urban farming', Seminar at SLU University Alnarp Community, Sweden December 11<sup>th</sup> 2013
- Interview in Casos de Exito, BREEN, innovación en cultivos acuícolas, December 16th 2013 - <http://work.noticiasdegipuzkoa.com/2013/12/breen-innovacion-en-cultivos-acuicolas/>
- Presentation at Iceland Ocean Cluster January 17th 2014 – guests included politicians and civil servants from municipalities, representatives from public media and the minister of industries and innovation in Iceland
- Kledal, P.R., Lecture on: '500 years of Urban farming in Denmark', Grøn Hverdag, Copenhagen January 21<sup>st</sup> 2014
- Morgunbladid (Icelandic newspaper) – January 23th 2014 - [http://www.mbl.is/greinasafn/innskraning/?redirect=%2Fgreinasafn%2Fgrein%2F1494923%2F%3Ft%3D939238291&page\\_name=article&grein\\_id=1494923](http://www.mbl.is/greinasafn/innskraning/?redirect=%2Fgreinasafn%2Fgrein%2F1494923%2F%3Ft%3D939238291&page_name=article&grein_id=1494923)
- Tímarit Haskola Islands / University of Iceland Magazine, February 2014
- Radio Interview in Bylgjan – Íbitid, March 4<sup>th</sup> 2014 - <http://vefutvarp.visir.is/upptokur?itemid=25090>
- Interview in Utvegsbladid, March 4th 2014 - <http://utvegsbladid.is/sameldi-i-husi-sjavarklasans/>
- Visit of the President of Iceland, Olafur Ragnar Grimsson, to Iceland Ocean Cluster March 11<sup>th</sup> 2014
- Radio interview on RUV – Ras 1, Sjonmal - <http://www.ruv.is/mannlif/naeringin-flyst-fra-fiskum-til-plantna>, March 24<sup>th</sup> 2014

- Presentations at the Aquaponics seminar at the ecovillage Solheimar in South Iceland on March 25<sup>th</sup> 2014
- Interview at Natturan March 28<sup>th</sup> 2014 - <http://natturan.is/samfelagid/efni/12580/>
- Presentation at the Municipality of Reykjavik March 28<sup>th</sup> 2014
- Interview in the local newspaper “El Diario Vasco”, about Breen and this project, April 16<sup>th</sup> 2014
- Presentation at the Municipality of Seltjarnarnes in Iceland, April 22<sup>nd</sup> 2014
- Presentation for representatives from Austurbru in East Iceland, April 28<sup>th</sup> 2014
- Presentation at the Municipality of Kopavogur in Iceland, May 20<sup>th</sup> 2014
- Design of Breens aquaponics development at Tknika, June 30<sup>th</sup> 2014, <https://www.youtube.com/watch?v=rApbKaWB8Ug>
- Article in Frettabladid (Icelandic newspaper), July 2<sup>nd</sup> 2014
- Article in Morgunbladid (Icelandic newspaper), July 16<sup>th</sup> 2014
- Article in Frettabladid (Icelandic newspaper), July 22<sup>nd</sup> 2014
- Article in Kopavogsbladid (Icelandic newspaper), September 8<sup>th</sup> 2014
- Presentations at the Aquaponics meeting at Tknika Basque October 2014
- Gutzmann, E. and Kledal, P.R., Aquaponics and the prospects of large scale commercial production. presented at Aquaculture Europe 14, San Sebastian, Spain, October 14-17, 2014
- Körner, O., Gutzman E. and Kledal, P.R., Modelling the symbiotic effects in aquaponics, presented at Aquaculture Europe 14, San Sebastian, Spain, October 14-17, 2014
- Thorarinsdottir, R., Implementing commercial aquaponics in Europe, first results from the EcoInnovation Project EcoPonics. presented at Aquaculture Europe 14, San Sebastian, Spain, October 14-17, 2014
- Information at Breens stand at Aquaculture Europe 14, San Sebastian, Spain, October 14-17, 2014
- Breen presented at the Television Program Sustraia November 25<sup>th</sup> 2014, see <https://www.youtube.com/watch?v=UeoFlk46VWU>
- Presentations at the Aquaponics seminar at Bioforsk in Grimstad Norway, November 29<sup>th</sup> 2014