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PROOF OF CONCEPT REPORT

GUTTERGROW
PROJECT 7682

Sustainable Opportunities Ltd

This Project is partially funded by

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BACKGROUND

Sustainable Opportunities Ltd. (SO Ltd), a university spin out company, was established to identify and develop environmentally sustainable products. The Company is developing four interlinking technologies focussed on a specific market opportunity.

- SO-GRO **GutterGrow** (a modular intelligent vertical plant growing system partially implemented in recycled plastic)
- SO-LED Solid state low power lighting for horticultural use (LEDs, OLEDs)
- SO-SIP Smart Intelligent Pipes (capture of heat into horticultural water systems)
- SO-LAR (solar power units for horticultural use)

The first product that SO Ltd is investigating to bring to the market is a low cost vertical growing system - **GutterGrow** - a vertical plant and vegetable 'allotment' for people living in high density urban housing but also with additional educational applications in schools.

GutterGrow supports the rapidly developing interest in 'green agenda' issues (grow your own, healthy eating, CO2 reduction) from a largely excluded group of potential participants. The majority of plant growing systems are intended for use where the grower has the necessary horizontal space, typically an allotment or garden. There are many people who would like to grow their own plants, fruit and vegetables, but do not have the necessary horizontal area, but do have vertical space to accommodate a plant growing system. These include residents of high rise buildings and occupiers of high density houses and flats with minimal garden space typical of modern city and urban environments. A gap exists within the market to produce vertical plant growing systems ('vertical allotments') to meet this growing market need.

SO Ltd was awarded 'Proof of Concept' funding from the East of England Development Agency to investigate the market potential for this GutterGrow product concept. The project proposal had the following elements:

1. Engage with students from the Centre for Creative Competitive Design at Cranfield University and Certwood Ltd to develop and optimise designs for a prototype.
2. Produce two prototypes for demonstration.
3. Protect 'GutterGrow' as a trade name
4. Demonstrate and promote the prototypes and conduct market research across a range of targeted potential customers eg Individuals, Local Authorities; Housing Associations; Schools and Community groups.
5. Improve a GutterGrow website and e-marketing strategy.

Prototype Design – Cranfield Centre for Creative Competitive Design

The design brief presented to the team at Cranfield design team included the earlier research findings by SO Ltd. undertaken with urban dwellers. This indicated that GutterGrow should be low cost and easily installed in a wide range of vertical spaces, particularly in restricted areas, such as balconies, terraces patios and classrooms. It must be stable and resistant to a range of weather conditions over the height of the system and the location of the building into which it is installed. The system should enable the growth of a range of plants with differing requirements (e.g. light, water, height, root depth) which encourages a succesful crop and in a manner which minimises the time and effort of growing container plants. The system should be modular to enable it to be expanded or reconfigured and intelligent to enable self-monitoring and adjustment (e.g moisture, nutrients), to meet the changing needs of growing plants and the varying weather and temperature conditions.

Various designs of GutterGrow were explored to meet these requirements, ranging from a basic version envisaged in the SO Ltd Patent application, utilising joints and tubes and a more customised design version employing injection moulded parts to be produced by Certwood. As a result of this initial exercise a two phase development process was agreed.

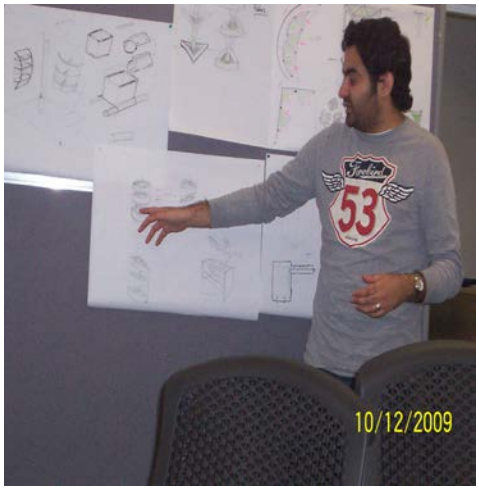
Phase 1 Demonstration Prototypes

The basic version of GutterGrow, envisaged in the Patent application, and consisting of a system of joints and tubes (JT System) for building three dimensional frameworks, has been prototyped and can be made available now to meet immediate requirements for a 2010-2011 product release. JT parts can be used to build a wide range of three dimensional frameworks onto which all types of plant container can be mounted. These frameworks can also be used with a full range of 'guttering' and many of the automatic watering and lighting systems currently available. It is proposed that the manufacture of the JT system proceeds immediately. The maufacturers of the prototype tubes (Luton Plastics) and the joints (Flowstore) have confirmed their willingness to work with SO Ltd to bring this product to the market. SO Ltd has secured an exclusive right to use the Flowstore parts for horticultural applications for at least the next year.

Phase2

SO Ltd will continue to work with the Centre for Creative Competitive Design at Cranfield and with Certwood a Luton based manufacturer on a second version of GutterGrow with an enhanced value added design. It has been agreed that a collaborative development project will be prepared with the objective of parts availability in 2011.

This second phase of development will produce an injection moulded interlocking and stackable plant container with a much greater 'object of desire' appeal than the utilitarian JT system. The capital cost of the tooling and the lead time to produce this version determine that this development will not complete until 2011-12. The Cranfield team and Certwood are considering a number of options relating to the design, timescales and funding options for the cost of the tooling.



SO Ltd and the team at the Centre for Creative Design Cranfield University

IPR Protection

SO Ltd has successfully registered 'GutterGrow' as a registered trade mark.

Demonstration of Prototypes and Market Research

The product concept and the prototypes were presented to potential customers and target groups (Individuals, Local Authorities, Housing Associations, Schools and Community groups). SO Ltd also had a stand at a major event - the BBC Gardeners World Exhibition at the NEC Birmingham which enabled them to engage with representatives of targeted groups as well as large numbers of amateur and professional garden enthusiasts.

The discussions covered the product concept, the suitability of the various designs and the prototypes and their usability for the target groups, with a particular emphasis on the potential advantages of adopting the 'GutterGrow' concept

Local Authorities

Local authorities were seen to be a key component in delivering support for the project as 80% of the UK population live in urban areas of which 41% live in one of the 10 most popular urban areas. There is currently a severe shortage of urban allotments due to the rising popularity of 'growing your own', interest in organic food, healthy eating and its cost effectiveness within the current recession. A recent survey was undertaken of allotment waiting lists data for 236 LA's . These allotment sites contained 156,490 plots for which 76,330 people were on the waiting lists. Local Councils are obliged to provide 15 allotments for every 1,000 households and no more than 6 people should be waiting for a plot at anyone time. Guttergrow was presented to the LA's as an opportunity to :-

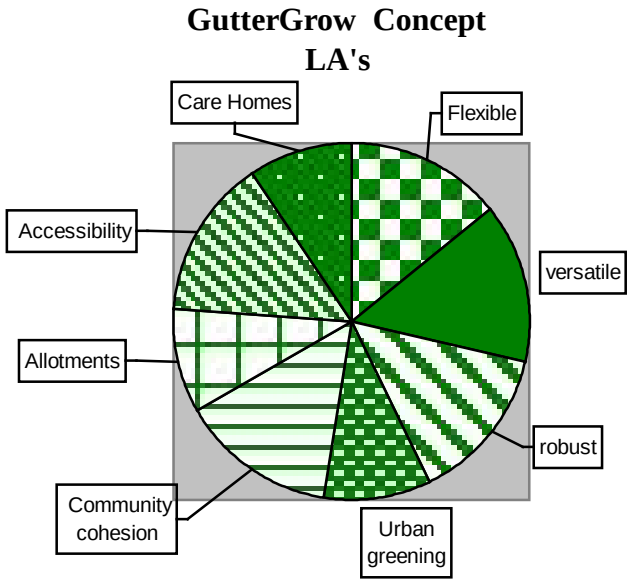
- provide a partial solution for local Councils legal obligations to address this shortfall in allotment provision
- assist Councils in their plastic recycling targets
- contribute to LA's commitment in reducing their carbon footprint under the Nottingham Declaration
- work with Housing Associations to create additional 'green spaces' in social housing

Discussions were held with a number of LA's in the Eastern Region as well as LA representatives at the NEC:

Findings

The concept was welcomed by the LA's as a useful addition to allotment provision, not only as an alternative growing system to be used in flats and houses with small gardens houses but as potentially supportive to initiatives such as Healthy Towns and Nourishing Neighbourhoods. It was felt that GutterGrow could provide an introduction to the experience of vegetable growing prior to leasing an allotment. It was agreed that there generally was insufficient allotment provision and as an interesting new initiative , an allotment officer suggested it could be used as a facility on allotment sites, in one case it was specifically requested to form part of a forthcoming eco allotment project. It was considered a useful system for community centres and care homes and particularly accessible for people with disabilities. Further discussions with one LA highlighted that growing

food was a potential aid to community cohesion. It was also seen as a useful project for LA's to engage with local schools to promote a wider environmental agenda on Carbon reduction
Luton Borough Council, for example, has direct responsibility for 8,300 dwellings and 13 allotment sites. All LA's worked with Housing Associations and it was generally agreed that there was potential for joint pilot projects.



Housing Associations

Housing Associations are currently one of the main providers of new housing developments and work with most local authorities in the provision of social housing. Two of the Housing Associations participating in this research cover a comprehensive range of areas in the Eastern Region.

Granta Housing Society is a charitable housing association with 2,700 houses and flats across the eastern region. It has properties in Thetford, Bury St. Edmunds, Bishop's Stortford, Corby, Northampton and Bedford, but is centered in Cambridge. It has introduced environmental initiatives such as green roofs on some new builds. Discussions were held with the Resident Involvement Co-ordinator who is the first port of call for residents and a central contact for resident officers in each area. The housing association has a strong sense social responsibility, and has a small community investment budget to use to enhance the living space of residents.

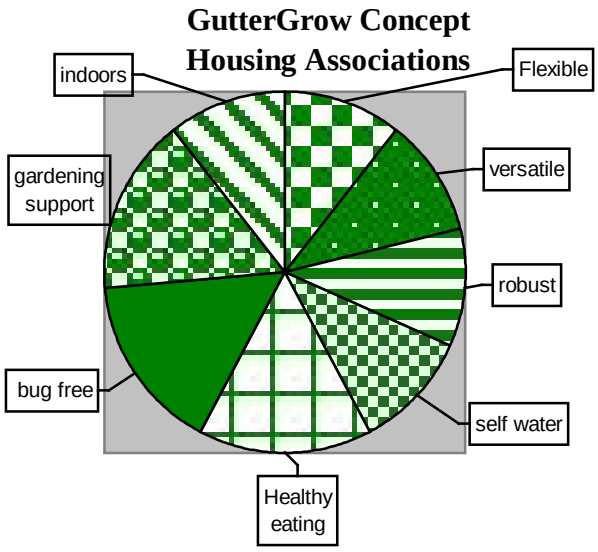
Sanctuary Hereward is the country's biggest provider of social housing. It manages around 10,000 properties across Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk. The properties include homes for families, single and older people and leasehold and shared ownership homes. These are run through offices in Ely, Hertford and Ipswich. The housing stock in Ely is largely former council properties built in the 1930s to 1950s, with mostly large gardens. The housing stock in Ipswich and Luton is mainly flats and houses with small gardens. Discussions were held with a Resident

Involvement Officer a key contact, whose duty is to promote healthy lifestyles as well as aid residents to build knowledge, self confidence and skills.

Findings

The Resident Coordinators were enthusiastic about the Concept and agreed it was an excellent idea. Both were keen to be involved in pilot projects. The Granta Housing Resident Coordinator expressed how impressed she was with the idea, "an excellent scheme" and keen on seeing it work. She is and happy to promote it to residents and could think of a number of places in Granta Housing where there is a mix of flats, bungalows and community centers, ideal for a pilot project.. She is planning to start talking to residents about the idea and will keep in touch about how to trial a GutterGrow prototype and provide feedback on where they put the unit, how easy they found it to work with and what success they had. In addition she felt that the product could work well in youth groups and clubs; in community centres and supported/sheltered housing where it could raise conversation and prompt interaction and sharing of learning. She highlighted the South Cambridgeshire Supported Housing scheme which has 44 schemes providing for 1,000 residents to whom she intends to mention GutterGrow .

The Sanctuary Hereward contact officer saw great synergy with the vision of GutterGrow, to not only promote to healthy living, but also allow people with little confidence in gardening or growing to learn and have guidance. He was enthusiastic about the prospect of residents being asked to use the prototype and providing feedback as he said "typically they'd never be approached for something like that" and it would be great for them to "talk to designers and be listened to which would help to build their self confidence and life skills". He mentioned that they already have some healthy living schemes in place, where, pensioners who find the garden too big to cope can turn over half of it to allotment (often then allocated to people with mental or learning disabilities under guidance). The surplus food not used by the allotment holder or the pensioner is sold at cost to other residents. He could see that GutterGrow could fit in with the elderly or disabled or others with mobility issues. However, looking at the Phase 1 prototype he felt that it would initially be more appropriate to test with flats or homes with smaller gardens, and he noted that most of the flats have balconies that could fit some of the GutterGrow designs. He also intended to discuss GutterGrow with Cambridge Housing which has 2,500 properties around Cambridge the vast majority were flats or houses with small gardens.



Schools

Schools have been identified as a potential market with food production featuring in the school curriculum. In a recent Government document (Securing Food Supplies up to 2050: the challenges faced by the UK Fourth Report of Session 2008-09 13 July 2009). The overall conclusion of the advisory committee was to welcome the increasing enthusiasm for 'growing your own food' and that the role of local and home production, and of educating children about food should be incorporated in Defra's vision and strategy for food. In addition there are current initiatives such as the Food for life Partnership which has involved 500 schools nationally and 108 in the Eastern region. A key part of its mission is to ensure every pupil has an opportunity to grow food. It aims to involve 3,600 schools by 2012. Primary and secondary schools were involved in the market research in addition to teachers and an education advisor who visited the NEC stand. Many of the schools had an existing measure of horticultural activities mainly consisting of small vegetable plots in the school grounds.

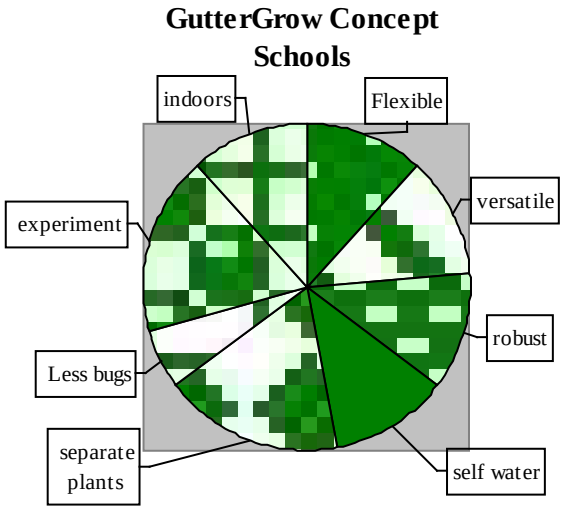
Findings

Discussions with school staff and volunteers working on horticultural projects in schools, confirmed that this was a welcome alternative approach to using school grounds for growing food. Problems cited in delivering this part of the curriculum are:

a) Lack of space in schools without adequate outdoor growing space.
b) When vegetables plots have been developed, they are often subject to vandalism and animal invasion.
c) Children often unable to follow the full growing cycle as many crops mature through school holidays therefore reliant on parents or teachers to manage them out of school hours..

All schools felt that GutterGrow offered a range of attractive options to grow food both inside classrooms and outside in confined spaces. The flexibility and mobility of the system was appreciated and the options for height adjustment and selection of containers. A welcome innovation was the option for pupils to take plants home at the end of term.. Additional benefits were the opportunities to conduct a range of experiments based around grow lights, measuring CO2

absorption and self watering systems. This was of particular interest to the secondary school where it could engage across wider curriculum requirement.There was considerable interest and enthusiasm by all schools to be involved in a Pilot Project.



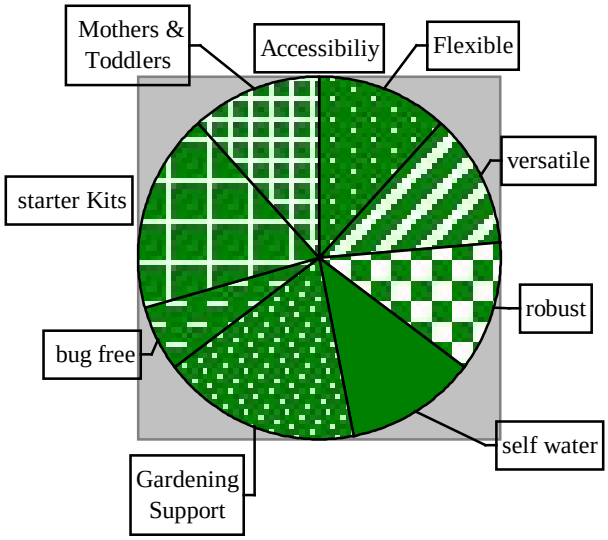
Community Groups

There is a potential market within Community Centres and Care Homes both of whom are now encouraging horticultural activities. These are part of healthy living programmes which are often run by charitable or community enterprises. Research was undertaken with a number of local charities that were directly involved with these activities, in addition to care home personnel at the Exhibition.

Findings

There was a marked enthusiasm by the charities for additional and more flexible options that they could offer to their clients, who were not only based in community centers but care homes and mother and toddler groups. Many were creating raised beds for some of these groups, but others preferred less permanent arrangements and felt that GutterGrow offered this option. Organisations with raised beds recognized that GutterGrow could be used as an additional growing area to complement the raised beds, in addition to its accessibility for people with disabilities, particularly for those in wheelchairs. They felt it was attractive as a starter kit and there were a number of requests to immediately set up pilot trials.

GutterGrow Concept
Community Groups



BBC Gardners World Exhibition NEC Birmingham

SO Ltd secured a stand at the 5 day exhibition to complete its research with with representatives of targeted groups as well as large numbers of amateur and professional garden enthusiasts. The stand was visited by over 500 visitors who spent time discussing the project and expressing their views on the concept, the prototypes and the alternative designs

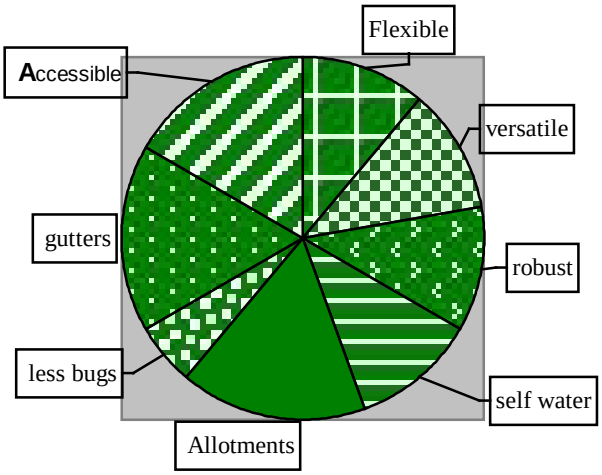
Findings

There was considerable interest in the prototypes displayed on the stand, and the majority of visitors thought it an excellent idea with a whole variety of comments on its application. Most liked its adaptability and flexibility for small spaces and robust design, citing it as particularly good for the elderly and children. Some thought the design was a bit industrial and clunky but could see this would be 'softened' by the plants.

Though most visitors had well established gardens the research identified that there is an unexpected, but potential large market for GutterGrow in this horticultural and established gardening market. This is manifested in the trend to grow seedlings in the protected (from slugs and other pests) environment of 'off the ground' containers. Gutters have started to feature strongly in this trend as they enable seedlings to be grown in long lines and then, once established, slipped out into trenches in gardens, allotments etc. The GutterGrow vertical garden support frameworks can therefore appeal as a valuable complement to the traditional horizontal allotment.

The most frequently encountered positive and critical comments were recorded and are listed in Appendix 2.

GutterGrow Concept
NEC



GutterGrow Website and Emarketing

The section of the Sustainable Opportunities website relating to GutterGrow has been improved and new content is being added in preparation for a formal launch. A strategy for development of the web site and for emarketing of GutterGrow has been agreed (see Appendix 3).

SUMMARY & CONCLUSIONS

The GutterGrow Proof of Concept project was carried out with a large number of participants. These included the designers from Cranfield, representatives from Local Authorities, Housing Associations, Community Groups and Schools, plus the more seasoned amateur and professional gardening visitors to the NEC BBC Gardeners World Stand.

The key outcomes of the market research across all groups indicated that the majority of participants thought:-

a) It was an excellent idea
b) Its flexibility and robustness were essential features particularly when used by children and people with disabilities
c) It was a practical solution for use in small areas and offered the opportunity to grow a variety of vegetables and plants.
d) That there was little else with the flexibility of GutterGrow on the market addressing this need

Additional features relating to the target groups were:-

1) Local Authorities viewed it as a potentially useful solution to the shortfall in allotments. In addition they saw added value in its use on allotment sites for people with disabilities, or those unable to cope with their plots but still wanted to retain the social interaction and benefits of allotment life. It was felt that in the current economic climate it would encourage 'grow your own' initiatives and potentially in relation to manufacturing and job creation, contribute to the local economy and low carbon agenda. They were keen to establish pilot projects in social housing, community centres, care homes and on allotments and were willing to nominate sites where these pilots could take place.

2) Housing Associations welcomed the concept and considered it an ideal initiative to complement their social agendas and healthy living schemes. They were keen to establish pilot projects as much of their housing stock was particularly suited to accommodate GutterGrow systems.

3) Schools considered it an innovative opportunity to implement a range of options to meet their curriculum requirements for growing food and healthy eating initiatives. Particularly welcome was the option for pupils to take their plants home and the opportunity to undertake additional experiments relating to monitoring, self watering, and use of LED's. It was also viewed as a means to support schools achieving 'Green Flag' status. All schools were keen to participate in the pilot projects.

4) Community Groups who were delivering services particularly horticultural and health support to care homes, community centres and mother and toddler groups were very interested in the concept. They felt it was ideal to offer as an alternative or complementary system to raised beds across a range of groups. They were keen to involve the Primary Care Trusts and to set up numerous pilot projects.

5) NEC BBC Gardening world discussions with visitors revealed an additional marketing opportunity with people with large gardens and allotments. They considered the concept of growing seedlings in vertical containers or gutters and reducing blight and slug invasion, complements the traditional horizontal methods. There was considerable interest and request for more product information both at the event and subsequently on line on the web site.

Prototype (Phase1)SO Ltd has secured an exclusive right to use the JT system for horticultural applications for at least the next year. The name 'GutterGrow' has been accepted as a registered trademark and this has proved to be well received as a memorable title for the product by the general public.

Prototype (Phase2) the additional designs developed by Centre for Creative Competitive Design at Cranfield and with Certwood Ltd, a Luton based manufacturer, on a second version of GutterGrow was shown and discussed with the target groups and members of the public. There were 4 designs preferred overall (see Appendix 1) and it is intended to use this information as the baseline for development of a more attractive (Phase 2) GutterGrow for 2011-2012.

Seed company SO Ltd has also contacted Mr Fothergills an East Anglian seed company to discuss potential collaboration. This was in view of marketing GutterGrow as a complete package including seeds and compost. The seed company was very positive about the initiative, indicating they were now specialising in a variety of plants suitable for container growing. They were happy to come to an arrangement for promotions and linking in to the GutterGrow website for online advice and blogs.

Distribution and/or sponsorship SO Ltd is meeting with Gardman Ltd, a major horticultural manufacturer and distributor to explore collaborative opportunities relating to GutterGrow.

CONCLUSION

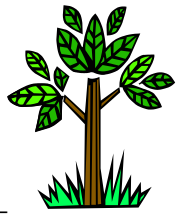
The overall results of the market research indicated that GutterGrow was very positively received and has a considerably larger and more varied market potential than at first envisaged. In addition, the fact that people were unaware of any other similar products implied there was a considerable opportunity in the market for GutterGrow.

The enthusiasm to run pilot projects by all groups indicate that this is a viable route to introduce the product into the market. Pilot projects also present opportunities for partnership working to access further support and funding. This is an opportune time to develop practical initiatives for healthy eating as there are numerous health and education schemes focussed on this subject, in spite of the Governments recent cuts ending the advertising campaign Change 4 life. SO Ltd anticipates that there will be various routes to partnership working and funding ranging from sponsorship, to private/public enterprise.

The research has also indicated there is strong support for GutterGrow to be marketed as a comprehensive package, to include seed or/and plant plugs, horticultural advice, internet support through the website, blogs and twitter, in addition to mobile applications. This provides a further range of opportunities to offer added value and develop related products/ enhancements.

Finally, though the initial focus of this project is 'grow your own' and 'healthy eating' there is also an underlying opportunity relating to job creation, contributing to the local economy, providing training and addressing low carbon and other environmental agendas. This market research has revealed numerous business opportunities to be explored with a variety of agencies, for example discussions with community groups has identified the potential for setting up social enterprises, with support for building the units, including horticultural and environmental training. This could be replicated across the region and nationally. It is felt that the realisation of this concept is of particular importance during the current economic recession and there is every expectation that this will lead to establishing a sustainable and socially responsible enterprise.

The Proof of Concept project has demonstrated to SO Ltd that the concept of GutterGrow is viable and that there are considerable commercial opportunities on which to build SO Ltd's business. SO Ltd has therefore decided to formally launch GuterGrow at the 'Edible Garden' show to be held at Stoneleigh in the Spring of 2011.



Acknowledgements
We would like to thank EEDA for their financial support and encouragement. The Proof Of Concept project has provided the evidence required by SO Ltd to bring the GutterGrow product to the market.