SecureChain
sustainable biomass energy

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www.securechain.eu

Dissemination and Communication
WP6 Final Report

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1. Executive Summary

This deliverable D6.4 presents all activities carried out in the framework of WP6 dissemination activities aimed at promoting and enhancing the awareness of target groups and related stakeholders towards the project objectives and outcomes. The purpose of these activities is a coordinated dissemination of the project's good practice examples and key messages among various communicators in the regions and the exchange with other initiatives/projects in the EU. The recalled WP6 objectives are:

O6.1 Implement an efficient and effective dissemination plan and exploitation strategy increasing the impact of the project outcomes among the target audiences

O6.2 Raise awareness among decision makers, stakeholders and private investors within the wider target groups in the regional contexts, and ensure optimal access and capitalisation of results on national and European level

O6.3 Establish effective dissemination channels and facilitate open communication among project partners, stakeholders in the regions and the international R&D community

The D6.2 DESP detailed the objectives, planned activities and guidelines for the duration of the project. This Report D6.4 comprises the documentation of the accomplished outputs so far. It includes the full record of:

a) *Publications and other content*: specific results of all WP's are summarised for press websites, articles, newsfeeds, media leaflets/brochures, workshop/seminar material, public reports, fairs and conferences and accessible through the website.

b) *Events*: Learning Labs, trainings and roadshows in the regions with an important dissemination function; public press conferences and related press work specifically inform the regional and local media; national and international conferences where SecureChain has been represented by consortium members.

The report covers the 2nd period of the project from 1/10/2016 until the end on 31/7/2018.

2. Overview on communication and dissemination results

Table 1 Dissemination and communication achievements

WP6 outputs	Target	Achieved	%
Website, setup, communication kit	1	1	100%
Publications	25	77	308%
One major LCA scientific publication	1	1 (LCA) 1 (bioenergy)	200%
SecureChain Events	12 Learning Labs 12 Seminars x Trainings	12 14 19	100% 117% 100%
Benchmarking visits	6 mutual visits 4 other regions	6 2	100% 80%
Conferences	5	27	540%
Final Conference	1	1	100%

Table 1 provides an assessment of the achieved results under WP6 compared to the proposed targets in the DoA chapter 2.2.2 'Measures to maximise impact'. All targets have been achieved with large success.

The **project website** www.securechain.eu was established early in the project and continues to be operational ever since (see D6.1). It will be maintained for 3 years. The main content is in English, but also model regions pages in national languages. It is the accessible repository for all main results, i.e. downloadable public reports and presentations. It contains also links to key national and regional websites of project partners and bioenergy stakeholders.

The consortium regularly published **news** on ongoing activities and important achievements of the project, through its website and e-newsletters. In **Social media**, partners have been very active on Twitter and Facebook, referring to project events, pilot projects, other bioenergy related events, etc

A large collection of **publications** including scientific and business articles has been produced, much more than initially foreseen, because partners aimed at further promoting the project to the wider audience. The consortium managed to submit two scientific publications to peer reviewed journals and doubled this indicator.

Regarding **events**, the regional lead partners surpassed their target (15/12). Learning Labs helped them successfully to work with local actors and stakeholders. Partners also achieved more seminars then foreseen (14/12), which also helped to maximize engagement with the local SME target groups.

8 **benchmarking visits** to partner model regions and other regions of consortium facilitated an animated exchange of ideas and experience among participants, thus promoting collective knowledge sharing and networking.

Many more **national and international conferences** than initially foreseen (27 / 5-10) were attained by the consortium, which ensured broad dissemination of the project and it results and attracted much interest from other consortia and stakeholders in bioenergy.

The **Final Conference** was organised in Brussels with the participation of all project partners and was a great success in reaching out to many external stakeholders and actors.

The following Table 2 is a list of all project-related dissemination outputs of the SecureChain project. It includes events organized and hosted by SecureChain beneficiaries as well as events of third parties, e.g. other European consortia, RTD institutions, the EC or other platforms, in which consortium members have participated and presented the project.

The Annex chapter of this report provides a large collection of the main dissemination results including main publications and sharp documentations of the various events.

Table 2 List of project communication and dissemination outputs per model region

No.	*Date*	*Title, content*	*Description, website or file link*
I.	**International**	**Communication by consortium**	
1	18-20/01/2017	5th Central European Biomass Conference (CEBC), Graz	Project presentation by BOKU, http://www.cebc.at Presentation of SecureChain project via several powerpoints sheets (eternal loop on TV) at the BTG stand in the exhibition hall. http://www.cebc.at/en/service/publications/5-mitteleuropaeische-biomassekonferenz/
2	08-10/03/2017	Austria Benchmarking Tour, Vienna, Styria & Burgenland region, Austria	The University BOKU in Austria organized a benchmarking tour for SMEs, key-stakeholders and partners of SecureChain Project. The tour aimed to benchmark other areas and synergies between SMEs. https://www.wau.boku.ac.at/abf/
3	03-06/09/2017	8th International Conference on Life Cycle Management, Luxembourg	Environmental assessment of bioenergy on the example of pilot projects using solid biomass. http://lcm-conferences.org/
4	02/11/2017	External sister project "SecValChain". Article "What you should know about pellet certification", 2017	Securechain partners participated in the project meeting of SecValChain in Ukraine. Additionally, a training was created to support all actors, including SMEs, in the value added chain in the forest and solid biofuels sector. The training showcased methods and tools to optimize production processes and products, thus identify possibilities how to improve the quality of the products. Article published in the Ukrainian newspaper "Wood processor", 2017
5	18/01/2018	INEA Bioenergy Market Uptake workshop, Brussels	SecureChain project presentation to all current EU bioenergy market uptake projects, in the framework of the INEA workshop. https://ec.europa.eu/inea/en

No.	*Date*	*Title, content*	*Description, website or file link*
6	11-12/04/2018	Horizon 2020 Workshop on Bioenergy, Advanced Biofuels and Renewable fuels	SecureChain project presentation to all current EU projects on bioenergy, advanced biofuels and renewable fuels
7	06/06/2018	SecureChain Finance Day	Roadshow Event, focussed on financing in bioenergy, Brussels, Belgium http://www.securechain.eu/wp-content/uploads/SecureChain_Finance_Day_Programme_20180606.pdf http://www.securechain.eu/financeday/
8	07/06/2018	SecureChain Final Conference	Final Conference SecureChain, Brussels, Belgium. http://www.securechain.eu/conference/
9	10/06/2018	SecureChain: Small and medium enterprises securing future-proof bioenergy chains - Summary Report	This summary report documents the approach including an innovation voucher contest, advisory support tools and evaluation of results. It furthermore includes a collection of 15 SME pilot project factsheets from the six model regions in Europe. Published on ResearchGate by BTG and the SecureChain consortium http://dx.doi.org/10.13140/RG.2.2.36351.10403
10	09/07/2018	BE Sustainable article on the SecureChain project results	http://www.besustainablemagazine.com/cms2/securechain-smes-boosting-market-uptake-of-future-proof-bioenergy-solutions/
II.	**Sweden**	**Communication by ESS**	
1	2016/11/25	Conference “Bioenergidagen 2016”	Researchers from Linnaeus University in the field of energy and representatives from different companies presented their ongoing projects and results. Another focus was important conditions in the heat market, as well as technologies for gasification and combustion. http://energikontorsydost.se/bioenergidagen-2016
2	2016/10/11	Conference “Energiting Sydost 2016”	SecureChain was an active supporter of the organisation of the event, while it was introduced to the audience by the CEO of Energikontor Sydost Mr Ulf Hansson. It was followed by another lecture named Energy possibilities for Sweden and worldwide. It was held by Mr Tomas Kåberger, board member of

No.	Date	Title, content	Description, website or file link
			the enterprise Vattenfall and previous Director General for the Swedish national energy agency. http://www.energikontorsydost.se/energiting-sydost-2016
3	2017/01/18	2nd Learning Lab	SecureChain was introduced to the audience of the CEO of Energikontor Sydost Mr Ulf Hansson. It was followed by another lecture named Energy possibilities for Sweden and worldwide. It was held by Mr Tomas Kåberger, board member of the enterprise Vattenfall and previous Director General for the Swedish national energy agency. http://www.energikontorsydost.se/l/projekt/14710 https://s3-eu-west-1.amazonaws.com/static.wm3.se/sites/400/media/209959_SecureChain_RLL2_Report_Sm%C3%A5land_SE.pdf?1524128242
4	2017/01/19	Video about extractions of forest residues in Sweden	About opportunities for a greater extraction of energy from the forest through more efficient working methods to take out logging residues (branches and tops). Branches and tops are chipped and used in combined heating and power plants to produce green electricity and heat, so an increased extraction of forest residues yield not only more earnings for forest owners but also contributes to an increased share of renewable energy in Sweden. https://www.youtube.com/watch?v=KBn4e_5otYA https://www.youtube.com/watch?v=FSQSy84jgFQ
5	2017/04/25	Seminar “Conversion to pyrolysis oil and other biooils”	The participants were informed about governmental funding support for conversion and actions for energy efficiency. Another part of the seminar concerned some company's business experiences of combustion of bio oils. http://energikontorsydost.se/l/projekt/14785
6	2017/10/17	3rd Learning Lab	The meeting focused on finetuning of two of the regional initiatives and on presentation and discussions on how to go on with the third initiative. We also focused on further activities and actions for continued fostering of the various investments during the remaining lifetime of SecureChain. http://www.energikontorsydost.se/l/projekt/14710

No.	Date	Title, content	Description, website or file link
			https://s3-eu-west-1.amazonaws.com/static.wm3.se/sites/400/media/209960_SecureChain_RLL3_Report_Sm%C3%A5land_SE.pdf?1524128257
7	2017/11/09	Seminar "EnergiTing Sydost 2017" One of the three specializations was "fundings"	The participants divided into three various groups, after the introduction presentations, and before the final presentations. The headlines of the presentations in the specialization of "Fundings" was e.g.: i) Various possibilities to foster climate investments, ii) What is Horizon 2020 and how do you get funding, iii) How to receive EU-funding for enterprises, iv) Green loans for district heating investments to a preschool in the community Lessebo http://energikontorsydost.se/energiting-sydost-2017/
8	2017/11/29	Conference "Bioenergidagen 2017"	The conference had four main topics: i) Current status on regional research activities at the Linnaeus University, mainly concering combustion issues, ii) Various actions for regional/national production of biooils and biofuels for vehicles e.g. The planned production of biomethanol from SÖDRA, iii) EU policys and how the discussions and desicions affect the national/regional bioenergy sector, iv) Current status on regional projects, e.g. Small scale CHPs and SecureChain. http://energikontorsydost.se/2017-11-29-bioenergidagen-2017/
9	2017/12/6-7	Conference "Green Economy Days in Lviv 2017"	http://green-economy-days.com/
III.	**Germany**	**Communication by BTG**	
1	01/02/2018	Local dissemination on project information	https://www.bavweb.de/-metabolon/Forschung/Kooperationsprojekte/SecureChain?&La=1
2	24/04/2018	Learning Lab NRW	https://www.bavweb.de/index.php?object=tx%7C2886.5&ModID=255&FID=2886.629.1
3	07/06/2018	Final Conference	https://www.bavweb.de/index.php?object=tx%7C2886.5&ModID=255&FID=2886.670.1 https://www.bavweb.de/media/custom/2886_812_1.PDF?1528893874

No.	*Date*	*Title, content*	*Description, website or file link*
IV.	**Netherlands**	**Communication by BTG**	
1	2017/04/05	Learning Lab 2	Learning Lab meeting in Wesepe, the Netherlands. Three pilot projects presented their progress. Main topic: biomass harvesting from landscape elements http://www.btgworld.com/nl/news/article?id=171
2	2017/10/10	Green Business Club Twente	Visit of the GBC Twente to BTG, Presentation SecureChain
3	2017/11/21-24	GBC Twente annual meeting	Presentation on the annual meeting of the GBC Twente http://greenbusinessclub.nl/twente/succesvolle-tweede-jaardag-urgentie-is-vereist/
V.	**Spain**	**Communication by UPC & CTFC**	
1	09/2016	Article in "Catalunyaforestal", "Using Processor head tree, adapted to Mediterranean conditions "	To promote the harvesting of forest biomass, to obtain solid biofuels in Mediterranean conditions, is important to optimize and to improve the use of forest machinery. For this from CTFC we consider the need to give all the information regarding this kind of machinery to forest stakeholders, forest managers and foresters. This kind of machinery is the key of the logistics issues in the field to obtain solid biofuels. www.forestal.cat/bdds/imatges_db/revistes/document_1/REVISTA_9838400014770441.pdf
2	11/2016	Article in "Catalunyaforestal" "Using cable yarding to do forest collection in forest areas with some complications (mainly the slope and accessibility)"	To promote the harvesting of forest biomass, to obtain solid biofuels in Mediterranean conditions, is important to optimize and to improve the use of forest machinery. For this from CTFC we consider the need to give all the information regarding this kind of machinery to forest stakeholders, forest managers and foresters. This kind of machinery is the key of the logistics issues in the field to obtain solid biofuels. www.forestal.cat/bdds/imatges_db/revistes/document_1/REVISTA_9725200014811072.pdf
3	27/01/2017	Local radio interview	Interview to the Catalan Biomass Cluster manager on occasion of the Catalan Biomass Fair. Radio Terrassa.

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4	15/02/2017	2nd Learning Lab	The aim of the LL was to give the SMEs the possibility to jointly address some issues of concern that will help them in the shaping of their business idea, and also to collect some feedback from stakeholders. The first session was devoted to Communications and Marketing; an external expert was invited to lead a session on the general aspects within the bioenergy sector in Catalonia, and a fruitful debate was held between all participants. A second (brief) session was dedicated to discuss the financial risks that are currently under analysis within D5.2. The LL2 was mostly an internal working event, with confidential issues from the pilot SME projects (see report included in the text).
5	23/02/2017	Presentation at the Catalan Biomass Fair	UPC presented the SecureChain project within the Biomass Fair conferences. https://www.youtube.com/watch?v=6YtqrPu9ZbA See https://www.diba.cat/web/biomassa/-/5a-fira-de-biomassa-de-catalunya
6	24/02/2017	B2B event at the Catalan Biomass Fair	UPC, CTFC and the Catalan Biomass Cluster organised a networking event to facilitate business to business meetings. https://www.diba.cat/web/biomassa/-/5a-fira-de-biomassa-de-catalunya
7	25/05/2017	Power from Biomass event by the Catalan Biomass Cluster	UPC moderated a debate within a seminar on Power generation from biomass co-organised with the Catalan Biomass Cluster
8	01/06/2017	Article in the "Institut d'Estudis Catalans " (Institute for Catalan Studies),	IMPORTANCE OF FOREST BIOMASS IN THE ENERGY BIOFUELS MARKET, the case of Catalonia. http://revistes.iec.cat/index.php/QA/article/view/144044/142678
9	09/2017	Published article in “PRO Instalaciones” UPC	“Financing schemes for biomass district networks” published on the occasion of the Expobiomassa fair
10	10/2017	Article in “Catalunyaforestal”	Using hauling canals to extract firewood and biomass in forest with high slopes. www.forestal.cat/bdds/imatges_db/revistes/document_1/REVISTA_5467300015090280.pdf
11	12/2017	Article in “Catalunyaforestal”	The use of forwarders to do forest operations and the logistic isues to collect biomass and wood from the forest www.forestal.cat/bdds/imatges_db/revistes/document_1/REVISTA_8621600015160075.pdf

No.	Date	Title, content	Description, website or file link
12	22/11/2017	3rd Learning LabCatalonia	The 3rd LL was devoted to the available financial support and the perspectives for financing for the enterprises in the sector of bioenergy http://www.clusterbiomassa.cat/2017/10/24/08-de-novembre-financament-per-a-empreses-del-sector-de-bioenergia-i-financament-disponible/ https://www.crowdcube.es/ https://www.ecrowdinvest.com/ca/
13	12/2017	Article in a regional journal (http://blogs.iec.cat/icea/publicacions/).	IMPORTANCE OF FORESTRY BIOMASS IN THE BIOFUELS MARKET FOR ENERGY http://revistes.iec.cat/index.php/QA/article/view/144044/142678
14	June 2018	Article posted on Rural Cat infosite (RuralCat is the AgroIndustry virtual community of Catalonia)	The European project SECURECHAIN helps six Catalan SMEs improve their activity in the field of bioenergy https://ruralcat.gencat.cat/noticia/-/journal_content/2002/20181/3856801/el-projecte-europeu-securechain-ajuda-sis-pimes-catalanes-a-millorar-la-seva-activitat-en-l-ambit-de-la-bioenerg-1 / http://ruralcat.gencat.cat/web/guest/pritac/espai/projectes-europeus/-/submit-name/fitxa?id=79 / http://www.efimed.efi.int/portal/news/?bid=3099
15	01/12/2017	Seminar, La biomassa forestal al sector turistic	The seminar focused on providing the possibilities and the potential that the forest biomass represents for the business in the wider sector of tourism https://ruralcat.gencat.cat/documents/20181/68301/La%20biomassa%20forestal%20en%20el%20sector%20tur%C3%ADstic
16	11/12/2017	Seminar, Instal·lacions d'autoconsum amb biomassa	The seminar aimed to provide information on projects of self-consumption regarding generation of electricity and heat from biomass https://ruralcat.gencat.cat/c/document_library/get_file?uuid=441be908-80de-45f7-ad86-fb0ebae3763b&groupId=20181
17	13/12/2017	Seminar, Mecanització forestal, tallada I desembosc de biomassa, I logística de càrrega en vaixell	This info day seminar provided hands-on experience on thinning works in a leisure and productive urban forest as well as the biomass logistics http://afib.ctfc.cat/mecanitzacio-forestal-tallada-i-desembosc-de-biomassa-i-logistica-de-carrega-en-vaixell
18	During the project	Information about the project in specific CTFC Blog	Information about the Final Conference in Brussels http://afib.ctfc.cat/securechain

No.	Date	Title, content	Description, website or file link
19	May and June 2018	Dissemination of the final Event of the project	Mails to COST ACTION networks, projects partners of CTFC in Europe, biomass platforms and initiatives. http://blog.ctfc.cat/es/el-proyecto-securechain-acogera-su-conferencia-final-en-bruselas/
20	June 2018	Financing Risk Assessment Guideline – Brochure	Practical guidance to SME managers, entrepreneurs and financiers for the assessment of bioenergy projects http://www.securechain.eu/wp-content/uploads/SecureChain_Financing_Guidelines_Brochure_2018.pdf
VI.	**Greece**	**Communication by CLUBE, CPERI**	
1	20/10/2016	Project flyer in Greek language (printed by CPERI)	Project flyer in Greek language prepared and printed by CPERI http://www.lignite.gr/gr/index.htm
2	1/11/2016	1st Newsletter in Greek	The 1st Newsletter provided basic information about the Securechain project to the Greek audience
3	08/02/2017	Short Rotation Coppice for production of biomass and thermal use	Presentation of the quality assessment of biofuels within SecureChain project https://e-ptolemeos.gr/ptolema%CE%90da-imerida-thema-fities-xilodon-dasikon/
4	07/04/2017	Biomass Day Conference in Athens - METROPOLITAN EXPO (BIOENERGY EXPO 2017)	Presented the SecureChain project and the prospects of biomass district heating systems in Western Macedonia. www.aebiom.org/hellenic-biomass-association-hellabiom-organises-the-biomass-day-2017/ http://buildinggreenexpo.gr/presentation-category/biomassday/ https://clube.gr/biomass-day-conference-in-athens/
5	26/06/2017	Open event/discussion Learning Lab in Grevena - Grevena, Greece	The open event/discussion Learning Lab was organized under the auspices of the Municipality of Grevena. The Vice Mayor of Grevena Mr Trigonis expressed the great interest for the wider area of the Municipality of Grevena for Biomass District Heating Systems. https://clube.gr/anoichti-syzitisi-gia-tilethermanseis-sto-dimo-grevenon/

No.	*Date*	*Title, content*	*Description, website or file link*
6	28/6/2017	Study visit of Mademoiselle SA, Poria, Kastoria, Greece	The partners had the opportunity to learn how a biogas plant operates with raw material waste from fur animal breeding farms in combination with other biomass related raw material.https://clube.gr/episkepsi-stin-etaireia-mademoiselle-a-e/
7	28/6/2017	Study visit of DTS SA, Argos Orestiko, Kastoria, Greece	CluBE arranged a short visit to DTS SA facilities, where the participants had the chance to see the first eco-friendly fur dressing and dyeing factory in the world. https://clube.gr/episkepsi-sti-dts-a-e/
8	29/06/2017	Certification Training Day - Kastoria, Greece	The certification training day was organized by CluBE and the Chamber of Kastoria and was held by the German company DIN CERTCO and the Spanish R&D Centre CTFC – Centro Tecnológico Forestal de Cataluña. https://clube.gr/ekpaideftiko-seminario-gia-tin-pistopoiisi-viomazas-stin-kastoria/
9	16/10/2017	2nd Newsletter of SecureChain	The 2nd Newsletter provided information on the latest news of the project updates, events and meetings
10	30/11/2017	1st Article in web (by CPERI)	Celebration of the National Bioenergy Day in Athens and Kozani https://certh.gr/41C9FE50.el.aspx http://www.hellabiom.gr/%CE%B5%CE%BB%CE%BB%CE%B7%CE%BD%CE%B9%CE%BA%CE%AC-%CF%84%CE%B5%CE%BB%CE%B5%CF%85%CF%84%CE%B1%CE%AF%CE%B1-%CE%BD%CE%AD%CE%B1/%CE%B7-4%CE%B7-%CE%B4%CE%B5%CE%BA%CE%B5%CE%BC%CE%B2%CF%81%CE%AF%CE%BF%CF%85-%CE%B5%CE%BB%CE%BB%CE%B7%CE%BD%CE%B9%CE%BA%CE%AE-%CE%B7%CE%BC%CE%AD%CF%81%CE%B1%CF%82-%CE%B2%CE%B9%CE%BF%CE%B5%CE%BD%CE%AD/?lang=en
11	04/12/2017	Bioenergy Seminar	CluBE organised a Bioenergy Seminar about Internation Bioenergy Day where the representatives of CluBE presented the Project SecureChain https://clube.gr/seminario-vioenergeias/ https://clube.gr/seminario-vioenergeias-sto-plaisio-tis-ellinikis-imeras-vioenergeias/
12	09/08/2018	Article in web: ypaithros.gr	Two European programs that change the energy landscape of Western Macedonia

No.	Date	Title, content	Description, website or file link
			http://www.ypaithros.gr/2-programmata-allazoun-energiako-topio-dytikhs-makedonias/
13	29/08/2018	2nd Article in web (by CPERI)	The article describes the mentoring approach to foster market uptake of the SMEs with reference to the Greek pilot cases https://energeiakozani.blogspot.com/2018/08/blog-post_29.html
14	All period involved	Various Facebook posts	CluBE, as WP6 Leader, made numerous posts on FB and twitter regarding events and meetings of SecureChain (posts are presented in relevant Annex page)
VII.	**Estonia**	**Communication by TREA**	
1	08–09/2017	Print article in nation-wide journal "Combustible and non-combustible energy resources 2017/2018", Estonia. In English and in Estonian	"Future of biomass fuels in the EU Commission proposals"; authors: Ülo Kask, expert on energetics of TREA, Estonian Bio-fuels Union, and Irje Mölder, foundation Estonian Private Forestry Centre http://eby.ee/ajakiri2017.pdf
2	27/11/2017	Article on TREA home page" Toimus taastuvenergia projektide rahastamise koolitus" – a conclusion of learning lab	Participants was informed about the planning and financing of business ideas and development projects, discussions of the differences between the money as a purpose and money as a tool. The involvement of external financing (including loans) for projects also community / cooperative financing, and the use of public finances to finance renewable energy and resource efficiency projects. http://trea.ee/blog/cobra-news/toimus-taastuvenergia-projektide-rahastamise-koolitus/
3	23/01/2018	Three posts about study visit on TREA Facebook page	Site visit to Taarapõllu farm: https://www.facebook.com/TartuRegiooniEnergiaagentuur/photos/a.176137578388986 5.1073741826.218390744855051/1909723969055045/?type=3 Site visit to Warmeston: https://www.facebook.com/TartuRegiooniEnergiaagentuur/posts/1909875045706604 Site visit to Fortum Tartu: https://www.facebook.com/TartuRegiooniEnergiaagentuur/posts/1910147855679323
4	29/01/2018	Article on TREA home page	The consortium and stakeholders visited the project site and ohter Southern Estonian companies, discussing about promoting and increasing the use of bio

No.	Date	Title, content	Description, website or file link
		"Secure Chaini projektipartnerid Eestis biokütuste kasutamise üle arutamas" – the conclusion of project study visit in Estonian	fuels. The visits included Taarapollu Farm. One of the Secure Chain project innovation vouchers in Estonia was issued to Taarapõllu Farm – the compliation and cost-benefit calculation of developing the micro-cogeneration plant using biomass. Also visited pellet production and district heating company using woodchips as a fuel. http://trea.ee/blog/cobra-news/secure-chaini-projekti-koosolek-eestis/
5	29/01/2018	Article on TREA home page "Secure Chain project partners and stakeholders in Estonia" – the conclusion of project study visit in English	The consortium and stakeholders visited the project site and ohter Southern Estonian companies, discussing about promoting and increasing the use of bio fuels. One of the Secure Chain project innovation vouchers in Estonia was issued to Taarapõllu Farm – the compliation and cost-benefit calculation of developing the micro-cogeneration plant using biomass. http://trea.ee/en/cobra-news/secure-chain-project-partners-and-stakeholders-in-estonia/
6	03/11/2016	Learning Lab- Financial planning and business plans for development projects	The learning lab included different topics starting with presenting the idea of promoting the future-looking environmentally-friendly bioenergy chains and ending with the individual consultations of financial planning
7	15/03/2017	Seminar-The quality of wood fuel and pellet heating	TREA and DINCERTCO organized seminar about the quality of biofuels and certification of fuels in Estonia. Major attendants were pellet factories, forest companies, Estonian Biomass Association Foundation Private Forest Centre. http://trea.ee/?post_type=cobra-news&page_id=760
8	18/04/2017	Seminar- Modern heating solutions and combining them with different heating systems	The seminar was intended for professionals, such as potters, designers and builders of residential heating systems; specialists in construction management and supervision, Presentations and discussions was on topics overview of wood fuels and combustion, different small heating solutions for buildings and combining them, fire safety and standards also new solutions of furnace and fireplace design. http://trea.ee/?post_type=cobra-news&page_id=771

No.	Date	Title, content	Description, website or file link
9	18/04/2017	Seminar- Modern heating solutions and combining them with different heating systems	The seminar was targeted to home owners and apartment associations. Topics was fire safety, methods of assessment, measurement and calculation of the amount of wood fuel, different small heating solutions for buildings. Also practical workshop introducing the methods of calculation of the cost effectiveness of heating solutions. http://trea.ee/?post_type=cobra-news&page_id=771
10	23/11/2017	Learning Lab- Financing the renewable energy projects	The lab was targeted to the municipal organizations, public sector and any developers of energy projects. The topics of learning lab: (1) renewable energy business projects, (2) renewable energy or energy efficiency projects aimed at optimizing overall administrative costs, and (3) renewable energy projects that are a result of community's common interest and/or need. http://trea.ee/?post_type=cobra-news&page_id=1304
11	23/05/2018	B2B meeting of Ilmasaare with investors	The B2B meeting, as Roadshow, was targeted to the Estonian pilot project EE2, Ilmasaare Village, for reason to discuss of investment to the renewable system developed by village
12	24/01/2018	SecureChain study visit to local stakeholders in Estonia	The consortium and stakeholders visited the project site and other Southern Estonian companies, discussing about promoting and increasing the use of bio fuels. Secure Chain project innovation vouchers issued to Taarapõllu Farm – the cost-benefit calculation of micro-cogeneration plant using biomass. http://trea.ee/en/?post_type=cobra-news&page_id=415
VIII	**Austria**	**Communication by BOKU**	
1	18-20/1/2017	Speech at the 5th Central European Biomass Conference in Graz, Austria	http://www.cebc.at/en/home/
2	23/1/2017	Post about Speech in Graz at Facebook page of ABF-BOKU	https://www.facebook.com/abfallwirtschaft/?fref=ts

No.	*Date*	*Title, content*	*Description, website or file link*
3	23/3/2017	Post about Benchmarking Tour at Facebook page of ABF-BOKU	https://www.facebook.com/abfallwirtschaft/?fref=ts
4	3-6/9/2017	Poster presentation at the 8th International Conference on Life Cycle Management in Luxembourg	http://lcm-conferences.org/
5	8/2/2018	Post about Partner meeting in Tartu at Facebook page of ABF-BOKU	https://www.facebook.com/abfallwirtschaft/?fref=ts
IX.		**Communication by DIN CERTCO**	
1	26-29/09/2017	Expobiomassa 2017 participation in stand	DINCERTCO participated in Expobiomassa 2017 stand that was organised by CTFC

3. Annex of main dissemination and communication outputs

3.1 Main project publications

3.1.1 Summary Report including Pilot Project Factsheets

Kies U., Reumerman P 2018. Small and medium enterprises securing future-proof bioenergy chains. Summary Report. BTG Biomass Technology Group, Enschede. http://dx.doi.org/10.13140/RG.2.2.36351.10403

3.1.2 BE Sustainable article

BE Sustainable newsportal by ETA-Florence renewable Energies. SecureChain – SMEs Boosting Market Uptake of Future Bioenergy Solutions. Web article. http://www.besustainablemagazine.com/cms2/securechain-smes-boosting-market-uptake-of-future-proof-bioenergy-solutions/

3.1.3 Risk Assessment Guideline for Bioenergy Project Finance (Brochure)

Arranz P., Horta F., Navarro P. 2018. A Risk Assessment Guideline for Bioenergy Project Finance. UPC, CBI, CTFC. http://www.securechain.eu/wp-content/uploads/SecureChain_Financing_Guidelines_Brochure_2018.pdf

3.1.4 Research paper on Sustainability Assessment by BOKU

Obersteiner, G., Scherhaufer, S., Kies, U., Reumerman, P., Horta, F., Ketikidis, V., Arranz Piera, P. (under review). Sustainability assessment of regional bioenergy projects: review and testing of feasible criteria and indicators for life cycle case studies at company level. Submitted to Biomass & Bioenergy journal.

3.1.5 Research paper on Forest Biomass in Bioenery Trade by CTFC

Navarro P., Raddi A., Codina M. 2017. Importancia de la Biomassa Forestal en el Mercat dels Biocombustibles per a Usos Energetics. Quaderns Agraris no. 43, 99-121. http://revistes.iec.cat/index.php/QA / DOI: 10.2436/20.1503.01.82

SecureChain

sustainable biomass energy

Small and medium enterprises securing future-proof bioenergy chains

Summary Report

btg biomass technology group

Europe's solid biomass to energy sector is dominated by SMEs. What is and can be their role in fostering innovation and growth in rural areas in view of the emerging bio-based circular economy?

The SecureChain project demonstrated how market uptake of efficient bioenergy systems and sustainable biomass mobilisation by SMEs can be promoted with the help of a dedicated innovation mentoring approach.

SecureChain
sustainable biomass energy

1. Context and objectives

Bioenergy refers to clean energy produced from a range of different renewable biomass feedstocks, of which a major share is wood / solid biomass. Bioenergy accounts for 61% of renewable energy consumption and 10% of the total energy mix in the EU-28 in 2015. The sector shows an average annual growth rate of 4.83% (2000-2015). Solid biomass clearly appears as the main source of fuel consumed, representing 95.3 Mtoe or 70% of the total 136.2 Mtoe inland energy consumption in 2015. In this context, it is clear that bioenergy will continue to play an important role in reaching the EU's 2030 and 2050 climate and energy objectives[1].

SecureChain was a Horizon 2020 project co-financed by the European Commission from 2015 to 2018, which focused on promoting market uptake of bioenergy in small and medium-sized enterprises (SMEs). The main objective was to promote a *Sustainable Supply Chain Management* practice that meets highest environmental quality and financial viability standards and targets local biomass suppliers, energy producers and financial sector players. Unique features of the project were that the entire bioenergy chain was considered, and sustainability and financing were an integral part of the project set-up. The specific objectives included the following:

The consortium of ten organisations united excellent competence in biomass, energy systems and efficiency, sustainability, certification and green investment (see list of partners on back cover). The project targeted SMEs in six model regions around Europe (see map), where it connected to various stakeholders in the bioenergy chain: energy agencies, cluster organisations, research centres, SMEs and industry associations.

[1] Figures based on AEBIOM Statistical Report 2017, www.aebiom.org

2. A mentoring approach for SMEs in bioenergy

Europe's solid biomass to energy sector is dominated by SMEs. What is and can be their role in fostering innovation and growth in rural areas in view of the emerging bio-based circular economy? SecureChain promoted the role of SMEs in bioenergy through a dedicated innovation mentoring package. Key activities included:

- ***Innovation vouchers***. In an open contest, SMEs could apply for specific support of their own proposed pilot projects. The best SME pilot projects were selected and received hands-on technical advice from the project team.

- ***Regional Lead Partners*** were the main contact point for SMEs and ensured region-specific oversight and quality control of the pilots' implementation.

- ***Learning Labs*** and various trainings were offered to raise capabilities of SME owners and to ensure wider stakeholder engagement in the regions.

- ***Sustainability checks***. *Life Cycle Assessments* (LCA) were carried out to evaluate the environmental impacts of SME pilots. Trainings and pre-checks helped SMEs to prepare successfully for *certification*.

- ***Financial risk assessment*** and advisory services to SMEs facilitated strategic business decisions and new investments into facilities and equipment.

3. Innovation vouchers and advisory support for local pilot projects

To stimulate engagement from local SMEs, an open call for promising pilot project ideas was launched simultaneously in all model regions. The scope of the call was - on purpose - broad and open to all SMEs in bioenergy, without any preference for a given fuel type or conversion technology. The pilot project idea, however, had to show good potential to foster biomass mobilisation and/or market uptake of efficient bioenergy systems. The call was opened in June 2016 for four months.

Following a thorough evaluation, all proposals were ranked according to six criteria, and the most suitable proposals were selected (20 out of 40 submitted proposals). These SMEs then engaged into a 2-years collaboration with the SecureChain team, coordinated and guided by the Regional Lead Partners.

The award of an innovation voucher of 3,000-5,000 € entitled an SMEs to obtain specific, dedicated advice from a local consultant of their choice, to support the development of the proposed solution and their business plan. Furthermore, the SMEs benefitted from the expertise of the consortium, which offered tailored advice and support for each individual pilot. The advisory services provided to SMEs through the vouchers and the consortium's work included:

- Assessment/mapping of locally available biomass supplies
- Technical appraisal and testing of new or improved equipment
- Feasibility of specific supply chain configurations and logistics
- Life Cycle Assessments of greenhouse gas emissions
- Cost-benefit analyses and exploitation calculations
- Financial risk analyses, investment scenarios, business plans
- Certification trainings and company pre-checks
- Trainings e.g. on biomass harvesting, quality and business plan development

SecureChain developed and tested this approach within a variety of companies and regional settings. The successful results show the potential of this method as a recommendable, transferable practice for support of market uptake by SMEs.

4. Supply chain canvas

The pilot projects cover the entire bioenergy chain, from biomass harvesting and fuel production to energy conversion and recycling. In all regions at least 3 pilot projects were initiated, ensuring an appropriate geographical coverage. The topics reflect the variety of technical solutions proposed by SMEs in the open contest.

Biomass → Energy Supply Chains *Region*	***Biomass harvesting*** 	***Fuel production*** 	***Energy conversion*** 	***Recycling*** 
Småland, Sweden (4 pilots)	Efficient harvesting of forest residues		Optimal biomass boilers for small municipalities	Wood ash pellets fertilizer
NRW, Germany * (3 pilots)	Improve biomass collection/sorting in trade centres	Valorise wood industry residues into pellets		
Gelderland & Overijssel, Netherlands (3 pilots)	Low-impact harvesting in landscape maintenance	Strategic storage facilities for quality wood chips		
Catalonia, Spain (4 pilots)	Optimise biomass logistics and trade centres	Up-scaling wood chips and pellet production	Renovated heating systems, cogeneration	
Western Macedonia, Greece (3 p.)	Fast growing tree plantations; mixed feedstocks	Wood wastes for energy use in wood industries	Improved biogas plant	
Southern Estonia (3 pilots)			Small CHP plants for village communities	Wood ash fertilizer production
Total: 20 pilots	8	4	6	2

5. Highlights of successful pilot projects

The following are good examples of successful collaborations of consortium partners with regional SMEs, consultants and public stakeholders, to develop, test and implement pilot project ideas of SME owners. See further details on the *Factsheets*.

- **Värnamo Energi AB**, Sweden. Biomass mobilisation through conversion of municipal heat plants. 14 small oil boilers in four villages are being replaced by four new biomass systems and an expansion and renewal of the district heating grid. The pilot investigated the optimal technical solution to supply heat to these communities and the interest of the potential local customers.

- **Lessebo Fjärrvärme**, Sweden. Exclude fossil fuel from the energy mix. A municipal heat plant company invested in an innovative flue gas condenser to ensure peak loads could be managed using bioenergy. The pilot will lead to expanded business and decreased emissions in the grid which supplies four communities.

- **Novalia Sinergie**, Catalonia, Spain. Upscaling of pellet production. The company enlarged their production by adding an extra pellet line for industrial pellets. The pilot was used to develop a commercial strategy and secure the funding for the enlargement. Furthermore, they obtained a certification for the domestic pellets.

- **AVEA GmbH & Co. KG**, Germany. Improved wood recovery from green wastes. A communal waste management company improved its green waste sorting process to make the underutilised wooden fraction accessible for thermal utilisation. The pilot helped to enlarge the capacity of the biomass yard and reduced greenhouse gas emissions per ton of green waste significantly.

- **Bruins & Kwast Biomass Management**, The Netherlands. Biomass mobilisation from landscape elements. The pilot included two companies, a municipality and a landscape management organisation, which aimed to select the optimal method for maintenance of a traditional cultural landscape with high ecological value. The pilot proved the feasibility under certain conditions and will be pursued in a follow-up demonstration project.

6. Learning Labs, stakeholder engagement and evaluation of results

Photo impressions from SecureChain Learning Labs and trainings

To ensure participation of more SMEs and other market actors, the project organised a series of regional outreach activities. The *Learning Labs* included meetings and workshops to sensitize local stakeholders about sustainable biomass use and bioenergy. SME owners presented their pilot projects together, allowing for regular feedback on the progress and impulses from other SMEs, experts and stakeholders.

Other participative events involved training sessions to raise capabilities of market actors, company visits, B2B seminars, presentations at industry fairs and conferences, and roundtables with public authorities and decision-makers. During study trips to other countries (Germany, Sweden, Austria), participants could visit various bioenergy companies and learn about best practice and latest systems (benchmarking).

An ex-post evaluation of the SMEs' experience showed significant appreciation, especially of the networking activities. 70% of SME pilot project owners indicated that they had taken concrete actions based on their involvement in SecureChain.

SMART performance criteria were assessed to measure the impact of each pilot at the end of the project. Substantial results were achieved (sum over all pilots, June 2018):

- Volume of additionally mobilised biomass: 142,000 tons/year
- Final renewable energy production: 2,300,000 GJ/year
- Reduced GHG emissions: 40,100 tons CO_2 eq./year
- Direct and indirect jobs created: 90 FTE/year
- Total investments triggered: 10.2 million EUR

7. Lessons learnt and main conclusions

Sustainable bioenergy projects are challenging for SMEs, because various business and environmental aspects along the whole supply chain play a role. Not every pilot project is a success story, but it increases the knowledge of the pilot owner and the involved stakeholders. SecureChain's experimental test of the practical mentoring scheme for SMEs led to the following main conclusions.

1. A ***hands-on mentoring approach***, using a combination of innovation tools such as vouchers, technical and financial advisors, trainings, LCA and certification can effectively support SMEs to overcome their specific challenges and unlock the market uptake potential of bioenergy. These tools work best when they are delivered by well-established local consultants or agencies.

2. ***Business clusters*** can play a key role in boosting bioenergy by matching partners both in the supply and the innovation chain. SME members can benefit a lot from knowledge exchange, technical advice and business matchmaking offered by clusters, plus a greater visibility as a result of joint promotion. Clusters should however be bottom-up and steered by the SMEs' own interest.

3. ***Public acceptance of bioenergy*** is extremely important. Education and communication of the economic and ecological benefits towards the public, and within the bioenergy sector, are key. Projects should adhere to all relevant environmental legislation.

4. ***Communicating best practice*** of successful bioenergy projects even from other EU regions raises awareness and is a great trigger for market uptake. Lessons learnt from successful, and unsuccessful projects, should be disseminated and exploited much wider in the EU, in national languages, aimed specifically at SMEs.

5. The ***multi-actor approach***, which aims at scientists and practitioners working together on real problems, is challenging for SMEs who have their mind focused on the daily operation. Good, continuous facilitation and tangible results are needed to make it work. Regional cultures and legal contexts have to be taken into account in the design of participative processes.

8. Pilot project factsheets

1. Värnamo Energi AB, Sweden. Biomass mobilisation through conversion of municipal heat plants.
2. Lessebo Fjärrvärme, Sweden. Exclude fossil fuel from the energy mix.
3. Skogsbränsle Småland, Sweden. Biomass mobilisation through ash recycling.
4. AVEA GmbH & Co. KG, Germany. Improved wood recovery from green wastes.
5. Bruins & Kwast Biomass Management, The Netherlands. Biomass mobilisation through landscape elements maintenance in Twente.
6. RiBo Holding, The Netherlands. Strategic Biomass Storage Facilities Gelderse Vallei
7. Hissink & ZN, The Netherlands. Innovative biomass harvesting machine for top- and branch wood.
8. Novalia Sinergie, Catalonia, Spain. Growing the production of modern solid biofuels for small-scale heaters.
9. Sala Forestal SL, Catalonia, Spain. Biomass distribution to end consumers with an innovative logistics model.
10. Taarapõllu Talu OÜ, Estonia. Small-scale CHP for autarky farms.
11. Haldusühistu Ilmasaare MTÜ, Estonia. Small-scale CHP wood gasifier for village cooperative.
12. Alfa Wood Group, Greece. More bark for biofuel, more wood for MDF!
13. AZ Bioenergia, Greece. Fast-growing biomass plantations for bioenergy end users.
14. Matesion Ltd., Greece. Improving feedstock supply management in a local biogas plant in Kozani.
15. Probiomassa, Catalonia, Spain. Pellet production vs distribution, and full customer service (ESCO model).

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Pilot Project Factsheet

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018

Biomass mobilisation through conversion of heat plants

Project partners

Värnamo Energi AB
Box 2268
S-331 02 Värnamo
Sweden
www.varnamoenergi.se

Finnvedsbostäder
Box 446
S-331 24 Värnamo
Sweden
www.finnvedsbostader.se

Figure in the head: The plant in the city of Värnamo: Source: Värnamo Energi

The municipality of Värnamo and the company Finnvedsbostäder had several small local fossil fuelled boilers in various communities nearby the city. Several were in need of renovation, partly due to age but also to convert to more environmentally friendly fuels. Meanwhile, the municipality and the company perceived these units as relatively small and not their core business. As the small heat plants were in need of major renovation, a golden opportunity arose to capitalize on the synergies that can exist between the municipality, Finnvedsbostäder and the heat plants of Värnamo Energi, and also with external real estate owners. The Parties agreed that Värnamo Energi has the best conditions to realize such coordination for synergies. The company aims to meet a certain maximum portion of fossil fuels in the energy mix. A consequence of the introduction of these small local boilers into their business was that the portion of fossil fuels was exceeded. Something needed to be done.

Partners

Värnamo Energi AB was formed in 1955 by a merger of two companies. In 1996, when the Swedish electricity market was deregulated, new demands were put on the energy companies to separate the sale of electricity and distribution of electricity (grid), hence the subsidiary Värnamo Elnät (electricity network) was formed. Värnamo Energi AB is partner in two local wind turbines. The operations are divided in business areas: power sale, heat, communication, gas, energy services, electricity grids and wind power. Finnvedsbostäder is the company, owned by the municipality, which originally owned the heat plants.

Activities

Värnamo Energi has been able to finance investments, by support of the national co-financing scheme for investments which will reduce GHG emissions. The innovation voucher was used for compilation of a base for an application to get funding from the scheme. The investments concerned replacement of 14 small boilers with four biofuel boilers in four various communities and expansion / renewal of the grid.

Map of the community of Bor showing the grid extension. Source: Värnamo Energi

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Pilot Project Factsheet

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018

SecureChain Partners

energikontor sydost

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www.energikontorsydost.se

BOKU

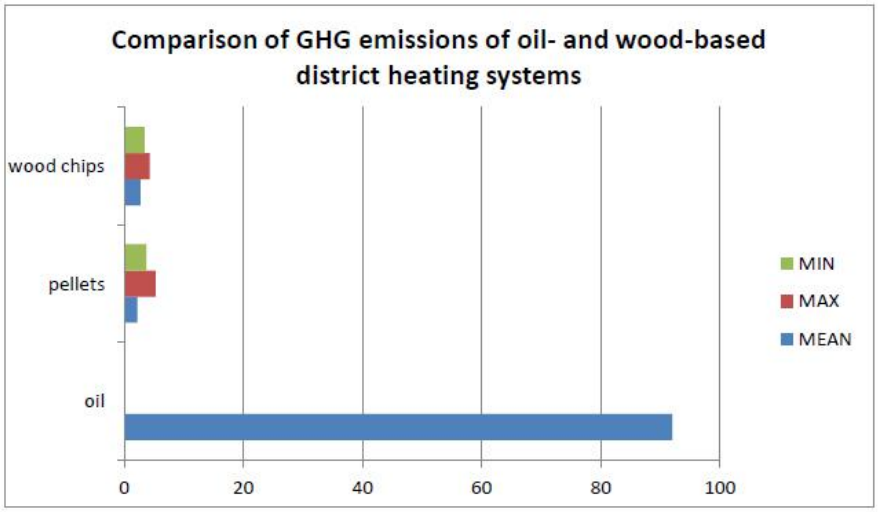
University of Natural Resources and Life Sciences
Institute of Waste Management
Muthgasse 107
1109 Vienna, Austria
www.wau.boku.ac.at/abf

Results

The project at Värnamo Energi concerns replacement of 14 small boilers with four biofuel boilers and expansion / renewal of the grid. The boilers are installed in the smaller communities around Värnamo. Some actions have been conducted to attract new customers, since the potential of heat deliveries will increase as a result of the investments. The boilers in ”Lanna” and ”Bor” has been co-funded with 0,85 MEURO (65 % of total budget). The consultant's report was used as a base for the application for co-funding. The enterprise used the national funding scheme, called ”Klimatklivet” (like “The big climate step”).

Digging for the extension of the grid in the community of Bor.
Photo: Värnamo Energi

Later on an application for extension of the DH grid in ”Bor” was submitted as a consequence of the previously granted one. They were granted for 0.4 MEURO (55 % of total budget). Even later, they submitted a new application for new boilers in ”Bredaryd ” and ”Forsheda”. They were granted for 3.0 MEURO (82 % of total budget). They have received even more grants for other actions to decrease fossil fuels in the energy mix, in total 5.1 MEURO.



Comparison of GHG emissions of oil – and wood based district heating systems. Source: BOKU

Progress in the various communities: *Lanna*: Excavations for extension of the DH grid is finalized. The boiler is implemented, it has been test operated and is in regular operation. *Bor*: Excavations is almost finalized. Parts of the equipment to the plant has been delivered. The boiler is ordered, planned to be delivered and operated before the summer of 2018. *Bredaryd*: Excavations are ongoing, almost finalized. The boiler will be delivered before the summer of 2018 and test operated the autumn of this year. *Forsheda*: Excavations will start in May 2018. The boiler will be delivered before the summer of 2018 and test operated the autumn of this year.

Follow-up

The activities with the purpose to attract new customers will go on. According to the conditions in the national funding scheme, the implementation must be carried out before the end of 2018.

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Pilot Project Factsheet

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018



Biomass mobilisation through implementation of flue gas condenser

Project partners

Lessebo Fjärrvärme
Stationsgatan 10
S-352 31 Lessebo
Sweden
www.lessebo.se/underwebbar/lessebo-fjarrvarme/lessebo-fjarrvarme.html

ITK Envifront AB
Blockvägen 8
S-352 45 Växjö
Sweden
www.itk-envifront.se

The essence of the project was to find the most appropriate way to exclude fossil fuel from the energy mix into a heat plant. The feedstock consists of wood biomass, mostly wood chips. Waste heat is brought into the grid of Lessebo from the nearby small pulp mill. The peak – and backup load is secured by bioenergy fuelled combustion facilities in three of these communities. The community of Kosta is the exception, where the deliveries are secured by a fossil liquid gas-fuelled facility. Fossil energy in the energy mix in combination with an expected increased demand of heat from a big costumer, were the main driving forces to investigate various options on how to exclude fossil fuel out of the energy mix.

Partners

Lessebo Fjärrvärme is the pilot project coordinator. It is an enterprise, owned by the municipality of Lessebo, located to the southeast part of Sweden. The enterprise is the owner of heat plants which they operate and maintain. The enterprise supplies heat into four various grids in four communities in the municipality of Lessebo. These communities are populated by between 1000 and 3000 inhabitants each, where some of the households, premises and industries have other heating systems, but district heating. ITK Envifront is the supplier of the flue gas condenser.

Activities

It has been a discussion during several years at Lessebo Fjärrvärme on how to exclude the fossil fuel in the energy mix in the heat plant of Kosta. The question became even more relevant when a big customer of the heat announced their plans for expansion of their business, with the consequence of a bigger demand of district heating. The opportunity to take part of the support from the SecureChain project appeared by that time. After taken part of presentations from two consultants, where one of them was hired after a recommendation from one of the other granted SMEs, a decision was made to implement a flue gas condenser. Discussions started with suppliers, one of them a young regional company, ITK Envifront.

SecureChain
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Pilot Project Factsheet

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018

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1109 Vienna, Austria
www.wau.boku.ac.at/abf

Results

There will be an investment in a flue gas condenser. This condenser is the first-of-a-kind. The construction is based on a new, innovative technology. An additional value for Lessebo Fjärrvärme is that this novel technology guarantees that the emissions will be lower than the new limits for emissions, which will soon be introduced according to EU legislations.

A new interesting business model has been agreed on for the purchase of the condenser. The rent Lessebo Fjärrvärme will pay during a couple of years is equal to the cost of the fuel they are going to save because of the higher efficiency of the plant in total. The business risk for the SME is minimal, and the supplier is supported by a demonstration plant implemented in the region in which they are operating.

The new EU legislation for emissions from combustion plants in the scale up to 20 MW, affects several of the energy companies in the region. With existing technology, it is primarily a problem to meet the limits of heavy metal emissions. Since the supplier of the condenser guarantees that their new construction meets the new requirements, the SecureChain project enabling the introduction of this technology, is of great value.

Part of the interieur of the heat plant in Kosta

Follow-up

The RLP has been in contact with the supplier with the help of Lessebo Fjärrvärme. It has been discussed, that during the upcoming yearly event "The Bioenergy day of Växjö", there will be a focus on novel technologies and best practise in order to enable the heat delivery companies to keep the emissions under the new limits according to new EU-legislations – a seminar where one of the highlights would be this new technology and, if possible after the condenser been in operation for a while, to present how the new condenser has affected the efficiency of the plant and the decrease of emissions. Lessebo Fjärrvärme will measure the emissions, probably by the help of students from the Linnaeus University.

Part of the system for fuel feeding

SecureChain
sustainable biomass energy

Pilot Project Factsheet

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018

Biomass mobilisation through ash recycling

Project partners

Skogsbränsle Småland
Tingsgatan 5
S-360 73 Lenhovda
Sweden
www.skogsbransle.se

XYLEM
Xylem
Jät Petersdal
S-362 52 Jät
Sweden

Figures: Cles Hellqvist and Askungen Vital

Pilot project concept

The project concept is to accomplish two actions in one, soil preparation and spreading fly ash. The first reason is to make the enterprise less vulnerable by the introduction of a new business, the second reason is to use the argument of securement of the supply of nutrients to the soil in order to get the possibility to purchase branches and tops from forest owners from clear cutting areas. The traditional way to secure the supply of nutrients to the soil is to leave the forest residues on the soil after clear cuttings or final fellings. When the ash is recycled back to forest land, it is normally in the shape of loose ash, which means that brush and vegetation close to the soil get a boost of nutrients. When using granules, the time for the leakage of the nutrients can be decided by choosing a certain radius of the granules.

Partners

Skogsbränsle Småland AB business idea is to purchase, produce and sale of forest fuels, particularly in eastern Småland. The delivered volume is approximately 230 GWh wood fuel distributed as woodchips. Deliveries are made mainly to heating plants where several of them buy all the fuel they need from Skogsbränsle Småland AB. In addition to forest fuels, the company conducts trade with other timber and by-products to a lesser extent. The company also undertakes felling assignments, etc. Forest fuel Småland AB has five employees, three of them work full time. In addition to these five, they employ a number of subcontractors, e.g. forest companies and haulage companies. In its present form and ownership, the company has run since 2009. Xylem is the company of the consultant.

Activities

The consultant compiled a financial model for the investment of granulation equipment. The company has been very active to organise meetings and to take part of seminars on the topic of fly ash. The reason for these discussions is to develop a concept for pelletizing / granulation and spreading, as well as development of business models with ash suppliers.

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018

SecureChain Partners

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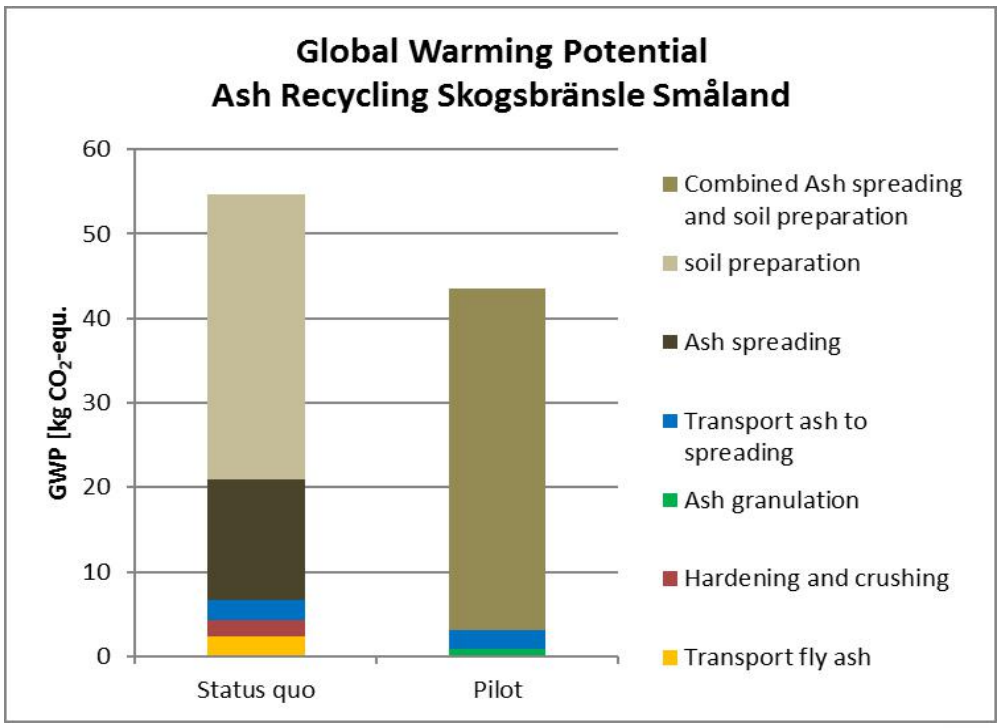
BOKU

University of Natural Resources and Life Sciences
Institute of Waste Management
Muthgasse 107
1109 Vienna, Austria
www.wau.boku.ac.at/abf

Results

According to the calculations, the plant for granulation has to be in operation 24 days a week and 24 hours a day to be financially viable. It means that the equipment has to be fed with big quantities of fly ash. The big heat plants are located a long distance from each other, meaning that a big part of the ash has to be transported more than 100 km. The costs for transportation are getting higher and they need several long-term agreements with many ash producing companies. The calculations require that the granulation equipment is located to a heat boiler facility, in order to co-finance the technicians required for operation and maintenance. The costs for soil preparation and spreading is lower when they are accomplished at the same moment, in comparison to one by one, but this difference is much lower in comparison to the higher costs for granulation and transportations.

Photo: Johanna Wallin



LCA for various options according to the initiative of Skogsbränsle Småland. Source: BOKU

The new innovative way of granulation and spreading the granules at the same moment as the soil preparation is done, has lower global warming potential in comparison to carry these moments out the traditional way, according to an analysis from BOKU. See figure. In summary the business idea will decrease the carbon dioxide emissions, but on the other hand it is not financially viable.

Follow-up

The costs for transportations, the big number of agreements with ash suppliers and the unforeseen high costs for the granulation equipment entails that the investment is no longer relevant. The topic on how to treat and spread the fly ash to encourage the forest owners to decide for extraction of branches and tops, forest residues, from clear cutting areas will go on in the region, even though this business idea seems to fail.

SecureChain
sustainable biomass energy

Pilot Project Factsheet

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018

Improved wood recovery from green wastes

Project partners

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A communal waste management company improved the process of green waste sorting to make the inadequately utilised wooden fraction of municipal biowaste accessible for thermal utilisation in local incineration plants. The project included a cost-benefit study and a life cycle assessment (LCA) of the enhanced bioenergy chain. The analysis helped to optimise the biowaste sorting logistics, valorise a larger share of the wooden fraction and enhance the biowaste handling capacity from currently 8.000 t/a to a maximum 10.000 t/a by 2018. The pilot project demonstrates how an improved technological process can lead to simultaneous economic and ecological benefits for the company and an increase of biomass mobilisation.

Partners

AVEA is a waste management company and the BAV is a public regional waste association in the Bergisches Land region in NRW, Germany. AVEA's services include collection, transport, treatment and disposal of waste within the area of two counties with an area of 1,300 km² and a population of 550,000 inhabitants. The BAV operates the MSW landfill site Leppe and an innovative educational and research centre, the :metabolon project, to raise public awareness for circular economy, resource efficiency and environmental technology.

Background and objectives

In Germany, circa 50 kg of green waste per inhabitant are collected annually (in NRW circa 44 kg). With further technical optimisation of the green waste collection in the future, circa 75 kg per inhabitant and year is likely to be collected. Under current conditions, this expected volume cannot be composted, because the biomass yards are short of sufficient space. More efficient sorting of the wooden biomass fraction (20-250 mm) is needed. This could increase the volume of recovered wood from green waste to circa 2 million tons per year in Germany, which corresponds to an estimated 24.8 PJ (6.89 TWh) per year equivalent to circa 10% of energy demand in German households.

The novel Circular Economy Act of NRW aims to improve the collection and use of waste, which will result in an increase of biomass streams, including green wastes. The AVEA company planned to enlarge and reorganise the Leppe biomass yard. The objectives were to increase the capacity for the processing of municipal green waste and improve the recovery of wooden biomass, (i) to reduce the external disposal due to capacity shortages, (ii) to improve the sorting of different green waste fractions, and (iii) to recover a calorific valuable fraction as combustible for industrial heating plants.

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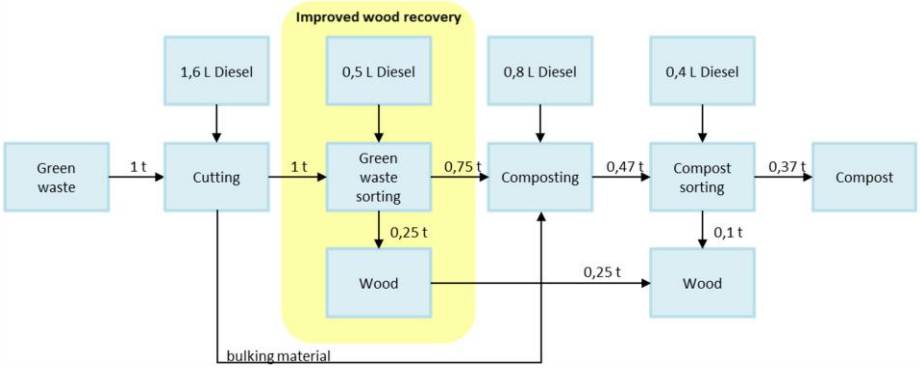
Green waste, compost heaps and the final compost product

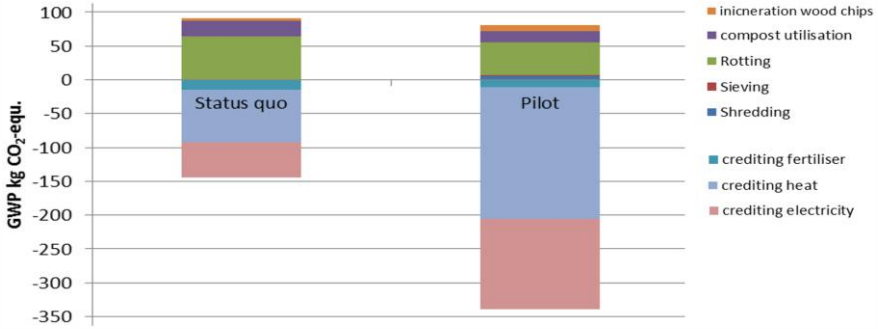
Actions and results

The consultations allowed to steer the process to the best result. The exchange with the experts helped essentially to focus the pilot on the main question: How can we optimise the output of solid biomass through an improved sieving process? Following this impulse, AVEA initiated specific sieving tests and carried out detailed cost comparisons of different potential equipment in view of performance, fuel consumption and durability. This allowed to identify a special equipment best suited for the process, a so-called three-fraction sieving machine.

Two scenarios of the sorting process were compared: The first describes the initial setup in which the wooden fraction is extracted after the composting. Here only 0.14 tons of wood or 1.69 GJ/t (0.47 MWh/t) can be retrieved per 1 ton of green waste. In the second scenario (see figure), a larger volume of wood is extracted with improved equipment before the composting. **0.35 tons** of wood or **4.36 GJ/t** (1.21 MWh/t) can be gained per 1 ton of green waste. Note that a smaller amount of compost is produced here, because more wood is recovered. The cost analysis proved the viability of the new process: Although revenues from compost sales decrease, the revenues from recovered wood increase and the external disposal costs can be saved. As a result, the annual processing capacity of the biomass yard can be increased by **+2,000 tons** and the expected total annual revenues can be more than doubled.



Researchers from BOKU carried out a life cycle assessment (LCA) of the two scenarios. Both scenarios result in effective greenhouse gas savings (negative balance), because considerable heat and electricity can be produced from the biomass. However, a significantly larger saving effect is achieved through the new process: the greenhouse gas emissions could be reduced by **203 kg CO_2-equivalents** per ton of green waste (difference status quo-pilot).



State of implementation (May 2018)

The construction works at the site have been almost completed. An additional investment of 100,000 EUR into a new sieve unit and a modernised sieving machine is being realised. The optimised process ensures the continuity of the important contribution of the biomass yard to regional resource efficiency and climate protection.

SecureChain partners

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SecureChain
sustainable biomass energy

Pilot Project Factsheet

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Biomass mobilisation through landscape element maintenance in Twente

Project partners

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Eelerwoude
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Pilot project concept

The essence of the project was the selection of the optimal method of maintenance of landscape elements (hedgerows, single-line tree stands, small forests as well as parks and avenues), focusing on Twente. Due to the loss of traditional functions many hedgerows have disappeared and maintenance of remaining ones has been widely neglected in the last decades (see pictures).

With better methods and organisation of the landscape maintenance, costs are expected to come down. Also, proper maintenance will mean that the bushes around the trees can be revitalised, leading to improved biodiversity and a higher quality of the landscape on the one hand (see right-hand picture) and increased biomass mobilisation on the other hand.

Partners

Bruins & Kwast Biomass Management – the pilot project coordinator - is a manufacturer and supplier of secondary (bio-) fuels and raw materials, originating mainly from fresh wood and high-calorific waste streams. Both the fuel and the raw materials are sold across the Benelux, Germany and Poland. Other project partners are a landscape maintenance consulting company (Eelerwoude), a municipality (Wierden), and a landscape management organisation (Landschap Overijssel). These organisations share a vision about the importance of proper landscape element maintenance.

Activities

Activities centred on two main issues 1. To investigate the biomass availability that proper maintenance can yield. 2. Determine the ecological advantages of proper maintenance of landscape elements and other ecosystem services. In addition, the financial implications were determined via an exploitation calculation.

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Project partners

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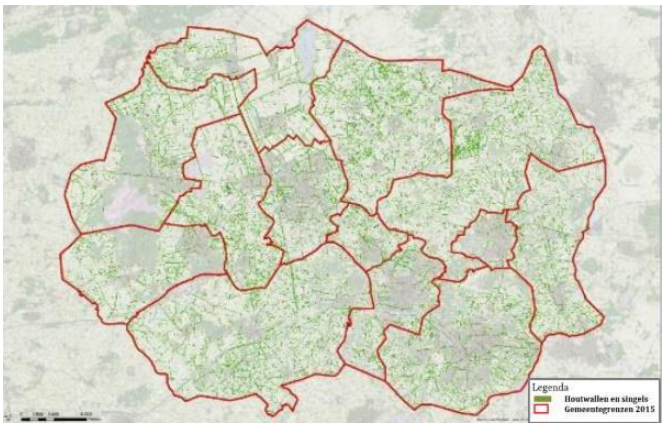
Results

The project has yielded an accurate insight in the quantity of hedgerows in Twente. Using satellite images, the total length of the hedgerows in Twente was determined to be roughly 4,000 km (see picture to the right). By comparing this information with the known number of hedgerows that are maintained, it was determined that 80% of all hedgerows in Twente are not properly maintained.



Taking up proper maintenance in Twente would lead to a one-off additional biomass availability of more than 200,000 ton, followed by a sustainable supply of 14,000 tons of biomass per year.

Besides the biomass that can be mobilised through regular maintenance, there are many other advantages. By revitalising the bushes in the hedgerow, local biodiversity increases. Furthermore, a properly maintained hedgerow can act as a dust filter, helps in reducing heat stress and has a positive role in soil fertility and water management. Hedgerows are also of historical value, and are important for an attractive landscape for tourists.

Results of the exploitation calculation showed that costs are higher than the revenues from the sale of biomass. However, if the management is administered by a municipality, or carried out by a collective it is expected that costs can be lowered, so that maintenance can be carried out break-even.

Follow-up

The results of the pilot project have been presented to Groene Metropool Twente. This is a cooperation of several municipalities that aim to develop and improve the countryside in Twente. The presentation was received positively, and as a result a follow-up pilot project is now being developed. The goal of this new project is on the one hand to demonstrate the opportunities of collective maintenance and on the other hand to show the ecological effects of proper maintenance of landscape elements.

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Strategic Biomass Storage Facilities Gelderse Vallei

Project partners

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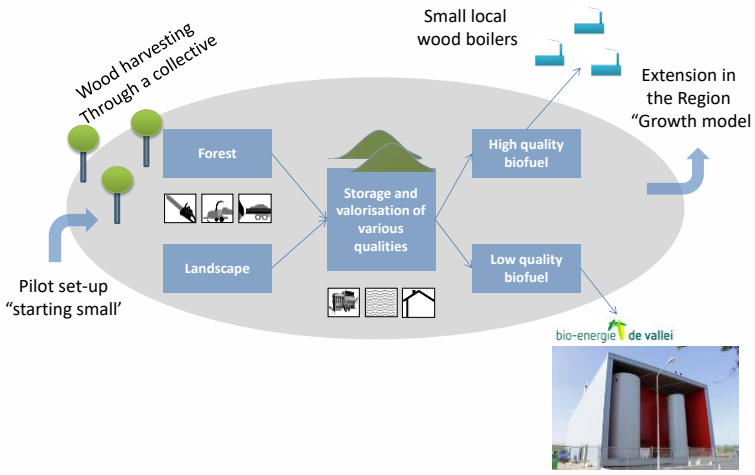
Pilot project concept

In this project supply of biomass from landscape elements (hedgerows, single-line tree stands, small forests as well as parks and avenues) is combined in a smart manner with biomass supply from common resources (forestry). Aim is to establish a biomass terminal that can produce biomass fuel of different qualities to serve various types of users.



By storing biomass in combination with drying and sieving a regular supply of biomass is ensured. High quality wood chips with a defined moisture content and morphology can thus be supplied to smaller boilers, while lower quality fractions can be supplied to larger boilers that are more robust and can handle lower quality biomass. The pilot project was initiated based on an ongoing effort to stimulate the maintenance of landscape elements in the Gelderse Vallei.

Partners

The company Ribo Holding – the pilot project initiator – is located in the Gelderse Vallei at the location of a former animal fodder company. Other partners in the project were Borgman Beheer Advies, expert in setting up biomass fuel supply chains. Supply of the biomass and organisation of the landscape maintenance activities was carried out by the association ANV Vallei Horstee. The municipalities of Ede and Barneveld supported the pilot project.

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Project partners

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Activities

The project started analysing the siting and design of the strategic storage facilities, applying lessons learned from visiting and inspecting similar facilities. An investment and operational plan for the initial phase was developed, as well as a scaling-up plan and an exploitation calculation, that consider future capacity expansion, in line with the anticipated growing availability of wood chips.

Results

The operational and investment plan was developed, describing the activities to be carried out and the required investments. Although use could be made of facilities already in place at the former animal fodder plant (like a weighing bridge), several investments/infrastructural requirements were identified, such as a retaining wall to be able to store and load wood chips at the terrain, a tarpaulin (see picture) that would allow for moisture reduction in the stored wood chips while keeping the rain out; a shovel/loader for occasional use, and a monitoring system to control the intake and supply of wood chips.

The space available for wood chips storage is 3,500 m^3, which is sufficient for the first phase. There is enough additional space available on the terrain for scaling-up to about 5,000 tonne/year.

Besides determining the required investment, exploitation calculations were made. An amount of 1,200 tonne/year was calculated as the break-even point. Above this amount, the costs for intake, handing, sieving and supply of wood chips would be compensated by the higher income because of higher wood chips quality and associated prices.

Follow-up

At the moment the storage space is in use, but faces challenges acquiring enough biomass. This is on the one hand a problem of lack of local supply, and on the other hand caused by increased competition from other market players. Priority is given to intensify actions to increase the wood supply before making a decision about new investments.

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01/04/2015 – 31/07/2018

Innovative biomass harvesting machine for top- and branch wood

Project partners

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uw mechanisatie-partner

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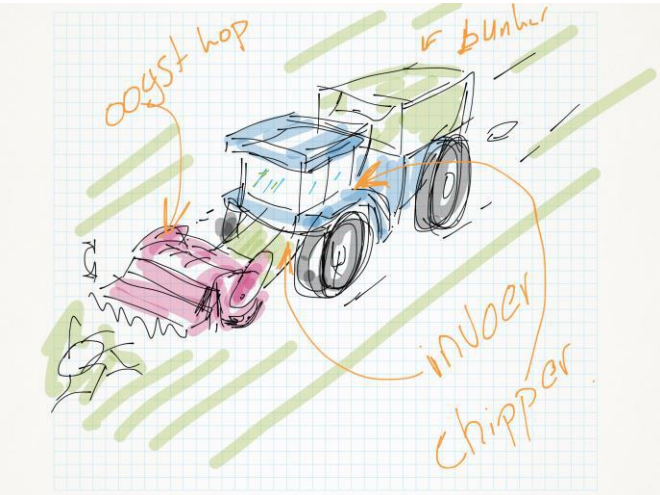
Pilot project concept

In the Netherlands, a high population density and a fairly limited forest cover (11% of the land area) mean it's important to consider a range of biomass feedstocks for renewable energy production. An untapped potential of woody biomass from forests and landscape elements is the top- and branch wood that becomes available as a result of forest and landscape maintenance.

For the process to be economically viable and considering the small average plot size in the Netherlands, it is important that top- and branch wood can be removed in a low-cost, efficient way. In this pilot project a machine was developed that can harvest, chip and transport top- and branch wood in a single pass. This avoids the use of separate cranes and forwarders.



Partners

Hissink & Zonen is an all-round mechanization company, located in Oeken (Gelderland/NL). Hissink has evolved from an agricultural mechanization company to a supplier and developer of tractors and machinery for landscaping, forestry and agriculture, including specialised machinery for biomass harvesting, collection and logistics.

Activities

With support of the engineering company iNodes a design was made for the new single-pass machine. In several iterations a collection unit was engineered that would be able to collect top- and branch wood, and to transport this material to a chipper. This collection unit was designed to be able to operate on relatively uneven ground.

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SecureChain Partners

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Next, a prototype was built and tested; first in-house, and later on in an actual forest stand. Applying life-cycle assessment (LCA) SecureChain partner BOKU (Vienna) studied the environmental advantages of using the machine as compared to the current practice. An exploitation calculation was made to determine the viability of investing in further development of the machine.

Results

The prototype machine was constructed in 2016/2017 at the facilities of Hissink (see picture). Use was made of an existing mobile chipper, and the collection device was constructed and mounted up-front. In-house testing showed that the machine functioned well, and basic functions (movement, raising and lowering of the collector unit, chipping, emptying the chips storage container) could be performed without problems.

After the in-house test, the machine was field tested in the estate “De Treek” in the Netherlands (see picture). During the field test it appeared that the machine was not working optimal yet, and that further developments were required. In addition, the weight of the machine (10 tonnes) appeared rather high in light of its intended application. This can be problematic on sensitive forest soils.

The LCA study of BOKO showed positive results in terms of CO_2-eq emissions when the machine is compared to the alternatives. The exploitation calculation indicated that the development of this machine could be financially attractive.

Follow-up

The additional developments required to make the machine ready for the market will mean that extra investments in R&D are needed. Funding for this is being sought.

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Growing the production of modern solid biofuels for small-scale heaters

Project partners

NOVALIA Sinergie

Group Renerbio

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Pilot project concept

The essence of the project is to scale up the production capacity of a Pellet Manufacturing Plant up to 64.000 tn/year. The company undertake an economic feasibility study to measure economies of scale and support fund raising activities.

In parallel, the SME visits referent pellet mills in Austria that helps to design the pellet mill scale-up project. Project partners help the company to certifies their pellets with Dinplus quality certification.

Secure Chain has been also useful to define the vision of the company. The company managers commit to eliminate CO_2 Emissions from electricity generation operations. Thanks to the Life Cycle Assessment, managers raise concern to measure and mitigate the CO2 food print from all the company's operations.

Partners

Grup Renerbio is a family owned and managed business with more than 20 years' experience in energy generation, forestry management and energy services. The group consists of three business units. Energy Generation and OMIE Wholesale Electric Market Commercialization. Commercialization of heat and power targeting Small Medium Enterprises. Pellet manufacturer certified as Enplus A1 Premium and Dinplus.

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sustainable biomass energy

Pilot Project Factsheet

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01/04/2015 – 31/07/2018

SecureChain partners

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Activities

Activities centred on three main issues: 1. Financial forecasting and Risk Assessment to support production scale-up benefits, 2. Life Cycle Assessment to measure the CO2 food print from all the company's operations, 3. Product Quality Assurance and certification.

Results

The economic analysis and companies financials forecasting has been used to secure debt funding from Regional Banks.

The Finance Director assistance to Climate Bond Initiative 2017 Annual Conference in London was useful to meet project finance investors. The company introduced their activities and presented a new project consisting on a Biomass CHP plant in Catalonia.

The Head of Production participation in a Pellet Mill visit in Austria was useful to decide the best manner to scale-up production.

The company it is been also favoured with the capacitation on quality assurance and the Din plus certification of their product.

Follow up

The company did not reach yet a production of 64.000 tn/year so is still in the process to consolidate the scale-up process.

It is an interesting case to follow to understand how competitive is the pellet produced in south Europe to replace central-European imports and from overseas.

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Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018



Biomass distribution to end consumers with an innovative logistics model

Project partners

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Generalitat de Catalunya
Departament d'Agricultura, Ramaderia, Pesca i Alimentació

Pilot project concept

The essence of the project is to reduce transport costs when distributing biomass to small scale woodchip boilers. The company undertake a feasibility study to test new processes and equipment's. The ultimate goal is to commercially implement an automatic and remote-controlled solid biofuels dispenser for distribution optimisation.



The pilot project happens in Catalonia and aims to serve clients located nearby, around 200 Km, the woodchip plant. Nowadays, these clients are served with a single stage logistics model that carries expensive distribution costs. This new model allows to attend unserved clients that currently face prohibitive transport costs to turn into biomass.

The project brings new technologies such as RFID, prediction systems and Internet-of-Things to traditional and environmental-friendly business to boost sustainable energies.

Partners

Sala Forestal – the pilot project coordinator - is a forest operator and manufacturer and supplier of secondary (bio-) fuels and raw materials, originating mainly from their own forest operations. Both the fuel and the raw materials are marketed in a sustainable and professional manner in Spain and France. Other partners are the Catalan Agriculture Authority that granted and recognized the project as an innovative solution to spur bioenergy in the energy.

Activities

Activities centred on three main issues 1. Estimate savings in transport cost and CO2 emissions with the new logistics model 2. Prototype machinery, equipment's and processes required to deploy the innovative logistics model. 3. Identify the best localization in Catalonia to deploy the first new logistics model.

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Results

The project has yielded an accurate insight in the quantity of woodchip that can be mobilized when the new logistics model is applied. The project developed economic analysis models that size the investments required to deploy the new technology and proof economic returns to the company.

The economic analysis conclude that the proposed logistics model would cut transport costs up to 30% and reduce CO2 emissions between 20 - 40% compared with the current distribution model.

The project accelerates the technology development and step-up company's confidence to pursue the business opportunity. Secure chain activities were helpful to decide how to protect the technology, better communicate the value proposition and identify the right partners to make it happen.

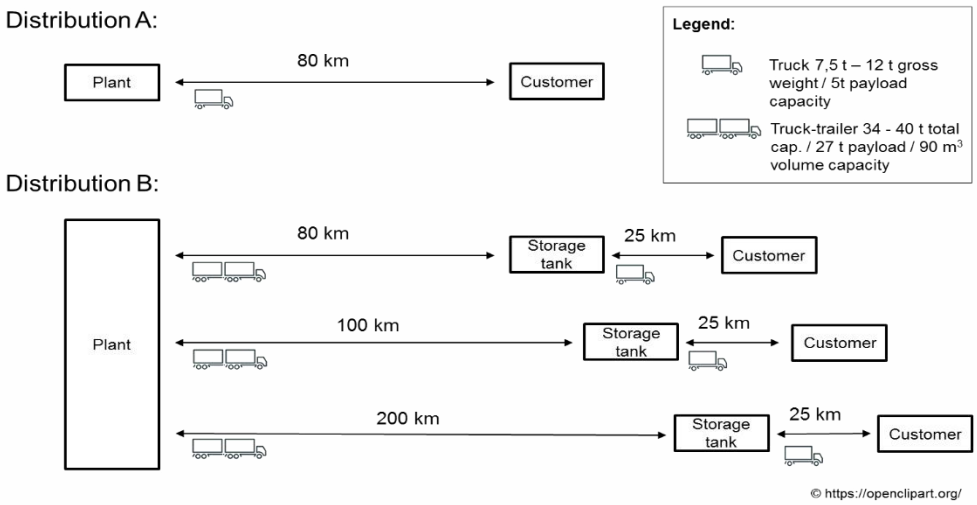

Figure: Example for the calculation of transport emissions

Follow-up

The company aims to build a commercial prototype in 2019 and validate expected benefits in a commercial environment. The company pretends to fully deploy the innovative logistics model in 2020.

This case study shows how crucial is transport cost to make biomass competitive. Investments on transnational biomass transport infrastructures are required to compete with fossil fuels that count with favourable transports costs due to transnational transport infrastructures such us LNG Pipelines.

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Pilot Project Factsheet

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Small-scale CHP for autarky farms

Project partners

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The aim of this project was to research the opportunities and effects to replace fossil fuel boiler of the farm with a biomass CHP. Specifically, the farm intends to install a wood gasification CHP. CHP suitable for the farm has capacity of 45kW electric and 120 kW heat. It is not common to install CHP plants in Estonia, despite that these solutions can be viable for numerous companies in Estonia. Therefore, introducing these technological solutions and best practices of working plants is innovative for local companies. In the case of economic profitability, the market is open towards implementing technology.

Partners

Taarapõllu farm is officially certificated organic farm that grows berries, fruits and vegetables in Võru County hills. Tartu Regional Energy Agency (TREA) has best competence and cooperation abilities in renewable energy solutions and energy efficiency in South-Estonia. TREA hired external consultant Pavel Bogdanov from Märja Monte OÜ for pre-study of technical solutions and profitability calculations. Märja Monte have had over 40 years of experience in thermal energy sector and P. Bogdanov has been in lead of that company from the beginning.

Background and objectives

Farm has an organic processing recognition, they products are marked and sold with eco-label, therefore is important to use as much as possible renewable energy to cover energy demand for production process. Farm leaders are interested of these solutions that are energy efficient, environmental friendly and that work at the local wood or other renewable energy sources. Pre-study of project addresses the following energy technologies as development scenarios: the local boiler plant wood working on woodchips for heat supply (Scenario I), woodchips-based boiler plant with local heating grid connecting all premises (Scenario II) and combined heat and power (CHP) plant running on woodchips (Scenario III). Company's heating and electricity consumption volumes were calculated based on forecast seen on Company's development plans. Calculated annual energy demand is 340 MWh of electricity and 625 MWh heat energy. Today they use light oil for heat production, by company's development forecast they will need 62 tons of oil.

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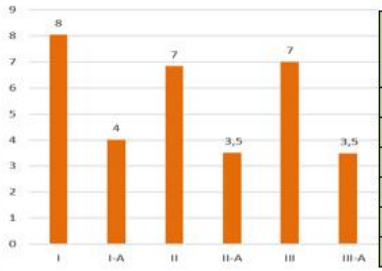
Choice of Taarapõllu products

Actions and results

In the framework of the project meeting in Estonia international experts visited Taarapõllu farm in January 2018 and there was discussion how to use Life Cycle Analysis to market Taarapõllu's eco-label products even better. Project team hired external expert by using of SecureChain IV for making of pre-feasibility study for biomass-based energy system for Farm. Suitable CHP plant for the farm was selected by considering heat demand. Three different scenarios were studied and compared if investment is made with and without national grant of 50%. The investment was evaluated by simple payback time, Internal Rate of Return (IRR) and Net-Present Value (NPV) that was calculated for 15 years – minimum lifespan of new boiler. Cash flow and the profitability analysis has demonstrated that from the three energy supply alternatives are equally profitable two: wood chips-based boiler and construction of cogeneration plants. For all scenarios a simple payback period was from approximately 3,5 years (with financial support of 50%) to 8 years (without of financial support).



Secenario		self-financing, *1000€
I	Woodchip boiler and DH grid (no grant)	155
I-A	Woodchip boiler and DH grid (50% grant)	77,5
II	Local woodchip boiler (no grant	135,3
II-A	Local woodchip boiler (50% grant)	67,6
III	CHP on woodchips (no grant)	275,4
III-A	CHP on woodchips (50% of grant)	137,7

Figure: Alternative simple payback times in years and self-financing volume for different scenarios

CHP scenario has equally good payback period compared with other plants, but initial investment would be about 2 times higher than other technologies and increased requirements for fuel quality and is somewhat more complicated to operate. Wood chips fired boiler is a simple technology that does not require a very high-quality fuel and is well-established practice. Project calculated impact on CO_2 emissions reduction is 485 tCO2 per year and over 4000 GJ renewable energy produced annually if CHP plant is installed.

State of implementation (May 2018)

Despite the fact that actions were stopped for while in Taarapõllu because of management and ownership changes in progress and previously planned national grants are not open yet, Taarapõllu is still looking to involve investments. Next meeting with investors will held on June 2018.s

SecureChain partner

TREA
Region of Tartu

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Estonia
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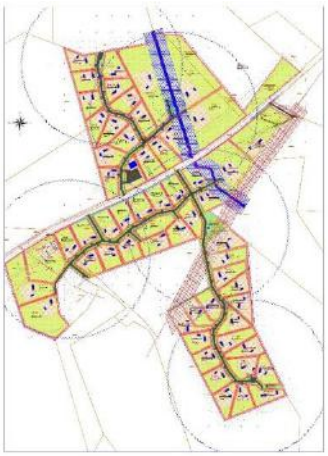
SecureChain
sustainable biomass energy

Pilot Project Factsheet

Funded by the European Commission Horizon 2020 grant agreement no. 646457
01/04/2015 – 31/07/2018



Small-scale CHP wood gasifier for village cooperative (Cooperative Ilmasaare)

Project partners

Haldusühistu Ilmasaare

Haldusühistu Ilmasaare MTÜ
Ilmasaare, Lääne-Harju vald,
76703 Harju maakond
Estonia
www.ilmasaare.ee

Project relates to one of the stage of development of energy cooperative, which is planning to become an independent community and independent form energy grids on next 10-15 years. There are 4-6 single-family homes under construction in the village and for the future it is planned up to 55 sites for construction. Project is focused on energy supply for Ilmasaare village and woody biomass transformation to energy through combined heat and power (CHP) unit based on wood gas technology. Energy needs for first stage can solved by electrical capacity of 45 kW and 110 kW for heat. In future households will install PV-panels and cooperative solar park will be developed for electricity production. Supply chain covers stockpiling necessary materials for CHP unit installation (equipment, technology, woodchips and byproducts of forest industry) and selling of produced energy to villagers and enterprises located in the area.

Partners

Commercial Association Ilmasaare is a commercial cooperative and the whole of its activity is based on the cooperative business. The main activity of the "self-financed" village Ilmasaare is the administrative and economic arrangements of village. Researcher form Tallinn University of Technology, Ülo Kask, prepared a preliminary study for independent energy supply and investment project. Tartu Regional Energy Agency is consulting Ilmasaare Village.

Background and objectives

Ilmasaare eco-community is interested of energy solutions that are energy efficient, minimally polluting the environment, and that work at the local wood or other renewable sources of energy and/or local. Ilmassaare is evolving self-sufficient eco-village and in the future energy cooperation that is independent from grid. Administrative association of Ilmasaare was founded in 2014. It is in North-Estonia, 45 km away from Tallinn, the capital of Estonia. Two years earlier, in 2012 NGO Ilmasaare Society was founded for the purpose to develop local villages economy, social life and culture and advocating green stances to save nature. Co-operative goal for Ilmasaare is to organize all

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The vision of Ilmasaare eco-village

SecureChain partners

TREA
Region of Tartu

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the village's energy supply and management, both for households and for business purposes. Ilmasaare village economy and energy independence is based on sawmill that residues can be used to produce electricity and heat for village's households. The plans foresee the next 10-15 years of Ilmasaare village development. There are up to 55 households planned to build into Ilmasaare village with average 150 m^2 of heated space per house that consumes annually around 13 MWh of energy.

Actions and results

Co-operative goal is to organize all of the village's energy supply and management, both for households and for business purposes. For this, they are planning to set up in 2017 a new legal body, an energy cooperative NGO "Ilmasaare Energy", whose principal activity is the production of electricity and heat in cogeneration plants. The heat-and electricity cogeneration will based on wood-fuel pyrolysis.

On the recommendation of the management of the village the study addresses on the three alternatives- solar energy generation with PV panels, micro station of combined heat and power generation and micro power plant working for wood-gas. In the study was evaluated profitability of three alternatives. The cost-benefit also sensibility and risk analysis were made. In terms of cash flow, and a sensitivity analysis has shown that from the three alternative electricity generation the using of solar PV panels is the most profitable. But as village needs also heat energy, the calculations showed if heat demand will rise to 420 MWh the micro CHP will become profitable also. An option is also power generation station running on wood-gas without producing heat energy. Payback time was 16 years, but it is more stable on production and security of supply of electrical energy then PV panels.

In result of study and knowledge gained the village cooperative need to move forward for developing the concept of village. Several meetings was held in this reporting period with topic of updating the concept of village and they energy management and to find possible investors for CHP plant. Also, meetings was targeted to prepare the roadshow. TREA proposed different options, three –steps roadshow, for community to find resources for investment on CHP plant. First step was looking for opportunities in national grant schemas. There is no available national grants for planned actions. Second step was - visiting of local banks for business loan possibilities, getting familiar with conditions and ask for proposal from banks. Representatives of village visited banks and checked possibilities for bank loan. There is option to use bank loan for financing of CHP. Third step was to arrange, with help of RLP (TREA), one-to- one meeting with possible investors. Meetings with TREA and two energy companies was organized for discuss of one to one meeting when village is ready to introduce their pilot.

State of implementation (May 2018)

There are no investors who would be willing to invest in the project and previously planned use of national grants didn't happen because grants are not open yet.

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More bark for biofuel, more wood for MDF!

Project partner

ALFA Wood Group
7km Grevena-Mavranaioi
GR 511 00, Grevena
Greece
www.alfawood.gr

Pilot project concept

The project addresses the use of bark for energy production, which nowadays in the Western Macedonia region of Greece is not used at all. Bark is rather left in the forest and can even become a negative factor, in case of wild fires. Bark contains however a high calorific value and could significantly increase the biomass input for biomass power plants.

ALFA Wood Pindos S.A. is a well-established wood panel producer. They aim to ensure the necessary quantities of raw materials i to cover the needs of the daily operation of the plant: currently the main supply is from the domestic residues market and covers 100% of the plant needs in heat production.

The company has installed two boilers of diathermic oil with combustion of biomass, designed to produce heat of 14.000.000 kcal / h with oil temperature of 275°C. The daily requirements of biomass fuel amount to 120-130 tons in total. The main fuels are husks and wood chips derived from the subproducts of the production process (logs peeling, mechanical separation of wood particles etc.).

The main concept is therefore the exploitation of the left over bark in forest operations as a new supply for thermal energy production in the existing plant. This demands a re-organisation of the supply chain, in order to include bark in its load capacity, the re-formation of suppliers to identify and store this raw material, the re-structuring of the production site of the company to be able to store, chip and feed the bark in the boilers.

In this sense, the advisory support of the mentoring package was expected to be used exactly to achieve these targets: with the assistance of the external consultant, the company will put an effort to re-organise its supply chain by means of contacting actors and stakeholders and help them communicate the needs to identify and store the raw material, re-structure its production site for the new storage and feeding needs.

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SecureChain Project Partners

CLUBE
Bioenergy & Environment Cluster Western Macedonia

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CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

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Greece
www.lignite.gr

BOKU

University of Natural Resources and Life Sciences
Institute of Waste Management
Muthgasse 107
1109 Vienna, Austria
www.wau.boku.ac.at/abf

Partners

The ALFA Wood group is the pilot project leader, represented by the owners, Mr. Anthony and Chris Adamopoulos. The external consultant of the company is Dr. George Ntalos. His main task was to re-organise the company's supply chain by communicating the concept to the actors and stakeholders in the supply chain, and target the needs to identify and store the raw material, and re-structure the production site for the new storage needs.

Results

According to the new business plan, Alfa Wood examined the possibility to substitute part of the energy wood, which is currently used as biofuel in the company's biomass boilers, with bark from the logs that the company uses to produce its main product (MDF).

Alfa Wood conducted a series of analyses of various percentages of bark within the fuel mixture, from a 80% bark to 100% bark. The laboratory analyses, carried out with support from CERTH/CPERI, demonstrated that it is feasible to substitute for a great part, even entirely, the useful wood with bark, the latter having a high calorific value and therefore acting sufficiently as a biomass fuel.

With the assistance of the SecureChain partners CLUBE, CERTH, BOKU and UPC, further feasibility calculations of such a substitution were performed. The results are encouraging as the economic benefits seem to follow the increase of the rate of substitution, without any further losses in technical or other dimensions of the operation of the company. Alfa Wood has however to pay attention how to best re-organise both its feedstock storage facilities and its supply chain: the various inflows and their combination need to be clearly separated and optimised in order to improve both the quality of its MDF products and the production of thermal energy for its needs.

Additionally, two further issues have been examined: The provision of the bark as a raw material is necessarily related to the operation of the forest owner cooperatives, which, following a new relevant law that forces them to merge, is expected to change the wood market in Greece. The company will follow closely this drastic change, to communicate with the new organisational schemes that will emerge and assist their mentoring and coaching, in order to secure standard quantities and qualities of wood supply.

At the same time, the company will also look into alternative biomass suppliers to ensure its supply in this context. Contacts with other companies in the SecureChain project (AZ Bioenergeia) generated potential mutual interest in developing energy crops. Finally, ALFA Wood also has shown interest in participation in a potential solution to establish a District Heating network for the nearby town of Grevena.

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Fast-growing biomass plantations for bioenergy end users

Project partner

AZ Bioenergia
Παπαϊορδανίδης Α.
Ευαγγέλου Σ. και ΣΙΑ Ο.Ε.
5ο Χιλιόμετρο Κοζάνης - Πτολεμαΐδας, Τ.Θ.:95, Κοζάνη 501 00

www.facebook.com/AZbioenergeia/

Pilot project concept

The project aims to develop electricity and thermal energy production from biomass. In the long term, the project includes the installation and operation of a power plant that will operate based on biomass. The total installed power for this plant will be 2.5 MWe and 7.5 MWth. The electrical side of this power plant/station will connect and provide supply to the National Greek Network of Transmission and Distribution of Electricity. The thermal energy can be used to cover heating needs locally (district heating). Due to its rural location and the adjacent activities, scenarios envisage the supply of the biomass materials from adjacent greenhouses and fast-growing plantations to significantly reducing the operating costs.

The biomass needs for the venture can be supplied from the agricultural sector, food industry and wood processing industries of the region of Western Macedonia in Greece. The biomass material will be collected from the local producers and processed accordingly. This is a crucial point for the success of the operation as it ensures the smooth flow of production and simultaneously engaging two major parts, creating a new supply and production chain.

AZ Bioenergia has already signed contracts with farmers in the region for harvesting of their production for biomass purposes. In addition, AZ Bioenergia experimented with the cultivation of paulownia for biomass in an area of 0.6 ha (580 trees) within the vicinity of the proposed power plant location.

Partners

AZ Bioenergia selected the company KOEM Consulting as an external consultant, who supported the preparation and the evaluation of potential investment proposals. In addition, it examined the model of logistics and supply chain management. Specifically, the research proposed solutions and guidance for network configuration, distribution strategy, and inventory management.

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SecureChain Project Partners

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Bioenergy & Environment Cluster Western Macedonia

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BOKU

University of Natural Resources and Life Sciences
Institute of Waste Management
Muthgasse 107
1109 Vienna, Austria
www.wau.boku.ac.at/abf

Results

In 2013, AZ formed a pilot greenhouse in order to cultivate and experiment with Paulownia plants, a fast-growing biomass crop. Later in 2013, the seedlings were transplanted from the greenhouse into the field. Since then, the company is monitoring their development with regular measurements.

So far the results are encouraging regarding the first 3 years of growth (2014-2017). The goal for 2018 is to create a larger scale greenhouse in order to produce larger numbers of seedling plants for energy purposes. AZ expects to undertake first harvest trials by December 2018.

The power plant implementation will be placed on land section registry 169 at Alonakia of Kozani Municipality, on a total surface area of 2.44 hectares. Licenses have been obtained from the Regulatory Authority for Energy (RAE) and the associated environmental authorities of the region of Western Macedonia, while the connection specifications of the Transmission Greek Electricity Distribution Network (DEDIE) and the installation license are in the pipeline and expected to be delivered.

However, there are significant delays in this venture, which raise concerns about the feasibility of the investment concerning the power plant construction. During the project, the discussions with the SecureChain partners and foreign experts from BOKU and UPC have made substantial contribution towards re-examining the whole business model.

At the same time, an opportunity has appeared due to the imminent closure of the Lignite Power Plant of Amyndeo that also provides thermal energy to the District Heating network of the town of Amyndeo. The power loss is going to be substituted by a biomass plant of 30MW, which requires substantial biomass quantities from the regional market. In this context, the AZ company is keen to seizing the opportunity and examines the upscaling of the Pauwlonia plantations, either through their own production, or through the production of farmers under AZ guidance.

A follow-up activity of coaching and assistance of technical and logistical solutions and technical support from the Regional Lead Partner is foreseen after the end of SecureChain. This includes support towards identifying potential funding, expanding the networking and developing the business case.

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Improving the Biogas Supply Management in a local biogas in Kozani

Project partners

MATESION
MANAGEMENT TECHNOLOGY VISION

Matesion Ltd.
Kastorias 1
GR 50100, Kozani
Greece
www.matesion.gr

Join4CS

Foundation for the Interregional Co-operation, the Co-creation, the Collective and the Constitution of our Common Future
Perdika 16, 50100 Kozani
Greece

Pilot project concept

The project addresses efforts to establish a well-structured biogas supply chain that could better address the feedstock needs of biogas plants in the region of Western Macedonia, Greece. The second goal was to better handle the animal manure in order to increase its added value, instead of burning the useful agricultural biomass residues. Biogas use is common all over the regional authority. The pilot project focussed on the Kozani district where Matesion ltd. has established its biogas plant.

At the beginning of its operation, Matesion used to rely on animal waste from mink breeding farms existing in the area as its main feedstock material. In addition, they accepted different feedstock (fruits, vegetables, animal manure, fat from food processing companies etc.) with strong seasonal character. The diverse feedstock material and the continuous changes in the mixture in the fermenter led to poor biogas production and problems with handling and insertion of this feedstock material.

A radical improvement to the quality and quantity of biogas was possible by adoptinga different strategy in supply chain management. The change was a result of the support by the SecureChain project, through the advice provide by the Regional Lead Partner and the international partners involved.

The new strategy shifted to different feedstock material with more stable character throughout the year. Instead of using mink animal manure as a primary feedstock material with problems in seasonality and the quality of material (usually came along with impurities and stones), Matesion now receives clean manure from a poultry farm in its vicinity. In addition, the company established a contract with a vegetable oil refinery that supplies them with vegetable oil waste which is appropriate for biogas production and a good biogas yield. Another important supplier is the food industry that was looking for a way to rid-off the ‘end of life’ food material; Matesion could provide them with the adequate solution.

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SecureChain Project Partners

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CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

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GR 50200, Ptolemaida
Greece
www.lignite.gr

Partners

Matesion, as the pilot project owner, has planned, developed and operated the pilot biogas plant in the district area of Kozani. Join4Cs is a non-profit company that strives to promote innovation practices in energy and environmental sectors. They supported Matesion ltd, in their effort to advance their supply chain in order i) to increase efficiency and proper waste management. (ii) to improve the sorting of different green waste fractions, and (iii) to recover a calorific valuable fraction as combustible for industrial heating plants. Furthermore two civil engineers, the company Grigoriadis and Sofologis Ltd., was involved in the collaboration.

Results

According to the business plan, Matesion Ltd. had to improve the substrate in order to increase the biogas yield. The company had to use specific substrates in a controlled combination in order to eliminate the 'death' period in feedstock supply, as well as to improve the quality of the substrate and its homogenization.

This was achieved through a change of the substrate mix which improved the C:N ratio and allowed to obtain a more homogenized substrate with a standard combination of different feedstock. Following this new procedure, the company manages to keep constant feedstock characteristics and reduce losing time period needed for the homogenization of the new substrate. This is a result of the identification of new feedstock, such as the vegetable oil from an oil refinery, and the expired food waste from the dairy food industry. The new feedstock has very good biogas potential and, most importantly, is available in standard quantities and in regular supplies. The company increased the operational time and significantly reduced the down time between different waste batches, improving the biogas yield and reducing the volume of post-treatment material.

In numbers, the new combination of feedstock improved the biogas yield by approximately 20% and at the same time reduced the down periods by almost 40%. As a consequence, the capacity factor of the biogas unit increased from 5,500 to 7,500 hours/year. The overall energy production was increased reaching the 3,000 GJ/year or 830 MWh/year. This also improved the financial performance of the unit by around 20%.

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Pellet production vs distribution, and full customer service (ESCO model)

Project partners

PROBIOMASSA
ENERGIA NATURAL

l'e

Plaça Catalunya 6
08140 - Caldes De Montbui
Barcelona – Catalonia

http://www.probiomassa.com

Pilot project concept

The goal of this pilot project was to scale up their current pellet distribution business, in both ways of the bioenergy supply chain:

- Upstream: by opening either a pellet/woodchip manufacturing line or diversifying the pellet/woodchip wholesale supplier's portfolio. In either case, wood would be sourced from local forests where arrangements with forest owners have been reached.
- Downstream: by selling boilers and stoves together with pellets and woodchips, or even by selling final energy (heat, electricity) under an ESCO scheme

The pilot project is based in the PROBIOMASSA logistic facilities located in the town of Caldes de Montbui, at about 20km from Barcelona. Pellet clients are distributed among the counties of Bages, Vallès Oriental and Vallès Occidental, and pellets are supplied in bulk (with a pneumatic, adapted truck that can fill the final client tank), in big bags (up to 1000kg) or in small bags (15 kg).

The key aspect to analyse was the viability of a pellet manufacturing plant, and the financing options that could make it possible.

Partners

Probiomassa is part of the Electra Caldense (l'Electra) group, led by a utility company located in the Vallès region, with headquarters in Caldes de Montbui. The company is dedicated to the design, construction and operation of energy infrastructures and has 101 years of history. The utility supplies electricity to 14,000 clients. The business maturation drove to diversify its energy sources and nowadays complements electricity supply with gas and solid biomass supply.

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Nowadays Electra Caldense also operates as an Energy Service Company (ESCO); Electra facilitates the upfront investment, the O&M and supplies the fuel to the client that gets all he needs solved without assuming an initial investment and just compromising a recurrent affordable fee.

Probiomassa was founded in 2012 and currently has 3 employees, with a turnover of about € 200,000 and biomass sales of 1200Tn per year.

Activities

The evolution of this project primarily depended on the decision to be adopted with respect to installing an own pellet manufacturing plant vs scaling up the pellet wholesale procurement operations.

Results

The project partners developed an operational costs model that has been key to characterise the minimum level of biomass sales that would be needed to make the pellet manufacturing plant viable; after several months of sales growth monitoring, PROBIOMASSA could conclude that such minimum levels could not be reached in the medium term, and hence the construction of the plant was discarded.

The project then focused on diversifying the pellet wholesale suppliers' portfolio, with emphasis on local (small) manufacturers with limited distribution capacity. As a result, a new pellet distribution hub business model has been initiated by which several pellet brands are commercialised by the PROBIOMASSA sales network. The company has also increased its wood chip sales by optimising and scaling up its distribution vehicle fleet.

And this strategy has proofed to be extremely convenient, because it enabled PROBIOMASSA to withstand one large pellet manufacturer bankruptcy that took place right in the middle of this last winter campaign.

In parallel, the project has strengthened the company's sales by securing new industrial customers, such as a woodchip supply contract signed in 2017 with the Termosolar Borges power plant, as well as a strategic partnership alliance with one of the largest Catalan Engineering and Civil Works firm.

The constitution of the Biomass Cluster of Catalonia and its active role awarded to Probiomassa as member of the board since 2016 is considered of great value to enhance the company visibility, networking and regulatory outreach in the coming years.

Probiomassa was the company that received the most business meeting requests at the SecureChain B2B side event held at the Catalan Biomass Fair in February 2017.

Follow-up

The company aims to continue its techno-economic operational optimisation by engaging in medium to large ESCO projects (such as district heating and cooling networks).

More information: www.securechain.eu

SecureChain Project Partner

CTFC

Forest Science and Technology Centre of Catalonia
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www.securechain.eu

SecureChain
sustainable biomass energy

Consortium

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BOKU – University of Natural Resources and Life Sciences
Institute of Waste Management
Vienna, Austria | www.wau.boku.ac.at/abf.html

CLUBE – Cluster of Bioenergy & Environment of Western Macedonia | Kozani, Greece | www.clube.gr

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DINCERTCO Gesellschaft für Konformitätsbewertung mbH
Berlin, Germany | www.dincertco.de

CBI – Climate Bonds Initiative
London, United Kingdom | www.climatebonds.net

CERTH / CPERI – Centre for Research and Technology Hellas, Chemical Process and Energy Resources Institute
Thessaloniki, Greece | www.isfta.gr

CTFC – Centre Tecnològic Forestal de Catalunya
Solsona, Spain | www.ctfc.cat

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www.securechain.eu

SecureChain – SMEs Boosting Market Uptake of Future Bioenergy Solutions

Chiara Pappalardo July 9, 2018

How to foster the role of SMEs in bioenergy for innovation and growth in rural areas?

The Horizon 2020 project 'SecureChain' promoted sustainable supply chains of SMEs in bioenergy that meet highest environmental quality and financial viability standards. The results were recently presented at a final conference held on June 7, 2018 in Brussels. The main objective of the project was to roll out a dedicated mentoring approach for SMEs in order to facilitate the mobilisation of biomass and market uptake of most efficient systems. The project united competent partners in biomass, energy efficiency, sustainability, certification and green investment and targeted stakeholders in six European model regions, such as SMEs, energy agencies, cluster organisations and research centres.

SecureChain's mentoring package comprised the following:

1. Innovation vouchers: In an open contest, SMEs could apply for specific support of their own proposed pilot projects. The best pilot projects were selected and received hands-on technical advice from the project team.
2. Regional Lead Partners were the main contact point for SMEs and ensured region-specific oversight and quality control of the pilot projects' implementation.
3. Learning Labs and various trainings were offered to raise capabilities of SME owners and to ensure wider stakeholder engagement in the regions.
4. Sustainability checks. Life Cycle Assessments (LCA) were carried out to evaluate the environmental impacts of SME pilots. Trainings and pre-checks helped SMEs to prepare successfully for certification.
5. Financial risk assessment and advisory services to SMEs facilitated strategic business decisions and new investments into facilities and equipment.

Innovation vouchers for local bioenergy pilot projects

The 20 selected SME pilot projects cover the entire bioenergy chain, from biomass harvesting and fuel production to energy conversion and recycling. The award of an innovation voucher of 3,000-5,000 € entitled an SMEs to obtain specific, dedicated advice from a local consultant of their choice, to support the setup of the proposed solution and their business plan. Furthermore, the SMEs benefitted from the expertise of the consortium,

which offered tailored advice and support for each individual pilot.

A moment from the SecureChain Final Conference, 7 June 2018 in Brussels (from right to left): Maria Georgiadou, DG Research and Innovation of the European Commission; Uwe Kies, InnovaWood; Göran Gustavsson, Energikontor Sydost; John Vos, BTG Biomass Technology Group; Lesya Loyko, FORZA Agency for Sustainable Development of the Carpathian Region.

To ensure participation of more SMEs and other market actors, the project organised a series of regional outreach activities. The Learning Labs included meetings and workshops to sensitize local stakeholders about sustainable biomass use and bioenergy. SME owners presented their pilot projects together, allowing for regular feedback on the progress and impulses from other SMEs, experts and stakeholders.

Highlights of successful pilot projects

The following are a selection of successful collaborations of regional SMEs, consultants and public stakeholders to implement pilot projects.

- Värnamo Energi AB, Sweden. *Biomass mobilisation through conversion of municipal heat plants*. 14 small oil boilers in four villages are being replaced by four new biomass systems and an expansion and renewal of the district heating grid. The pilot investigated the optimal technical solution to supply heat to these communities and the interest of the potential local customers.
- Novalia Sinergie, Catalonia, Spain. *Upscaling of wood pellet production*. The company enlarged their production by adding an extra pellet line for industrial pellets. The pilot was used to develop a commercial strategy and secure the funding for the enlargement. Furthermore, they obtained a certification for the domestic pellets.

UPCOMING EVENTS

POWER-GEN Asia 2018
September 18 - September 20

First PAPTAC International Lignin Conference
September 18 - September 20

4th Advanced Biofuels Conference
September 18 - September 20

Green Energy, Green Engineering and Technology
September 20 - September 21

REFAB 2018: High-tech Strategy for a Sustainable Biomass Supply
October 1 - October 2

View All Events

- AVEA GmbH & Co. KG, Germany. *Improved wood recovery from green wastes*. A communal waste management company improved its green waste sorting process to make the underutilised wooden fraction accessible for thermal utilisation. The pilot helped to enlarge the capacity of the biomass yard and reduced greenhouse gas emissions per ton of green waste significantly.
- Bruins & Kwast Biomass Management, The Netherlands. *Biomass mobilisation from landscape elements*. The pilot included two companies, a municipality and a landscape management organisation, which aimed to select the optimal method for maintenance of a traditional cultural landscape with high ecological value. The pilot proved the feasibility under certain conditions and will be pursued in a follow-up demonstration project.

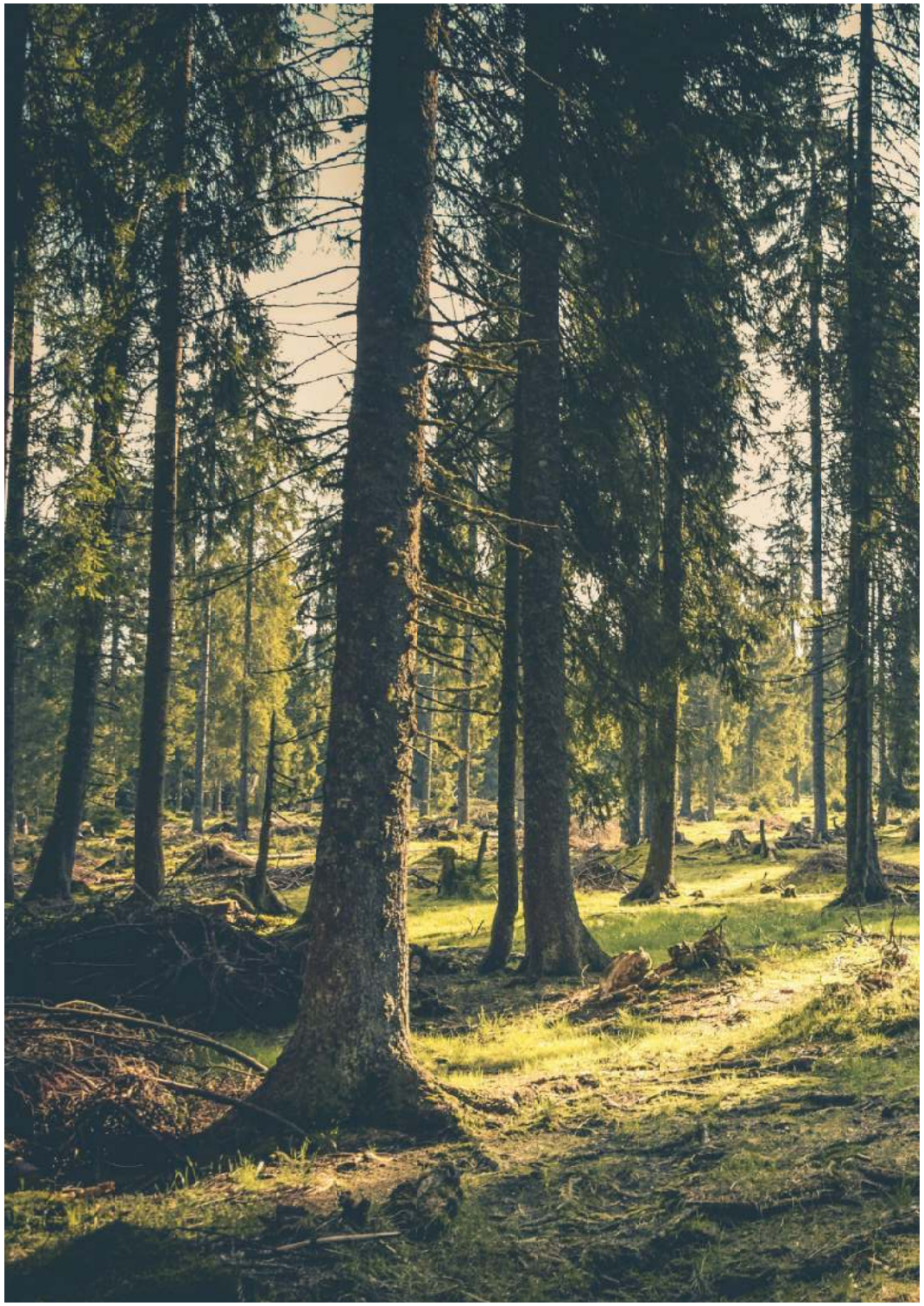
Lessons learnt and evaluation of results

Sustainable bioenergy projects are challenging for SMEs, because various business and environmental aspects along the supply chain play a role. SecureChain developed and tested the mentoring approach within a variety of companies and regional settings. Not every pilot project is a success story, but it increases the knowledge of the pilot owner and the involved stakeholders. An ex-post evaluation of the SMEs' experience showed significant appreciation, especially of the networking activities. 70% of SME pilot project owners indicated that they had taken concrete actions based on their involvement in SecureChain. SMART performance criteria indicated that the pilot projects mobilised around 142,000 tons of biomass/year, a final renewable energy production of 2.3 million GJ/year and triggered investments of 10.2 million EUR. The successful results show the potential of this method as a recommendable, transferable practice for support of market uptake by SMEs.

The main project results have been already published in a summary report, which includes also a collection of 15 pilot project factsheets. The report and all conference presentations are accessible at www.securechain.eu/conference.

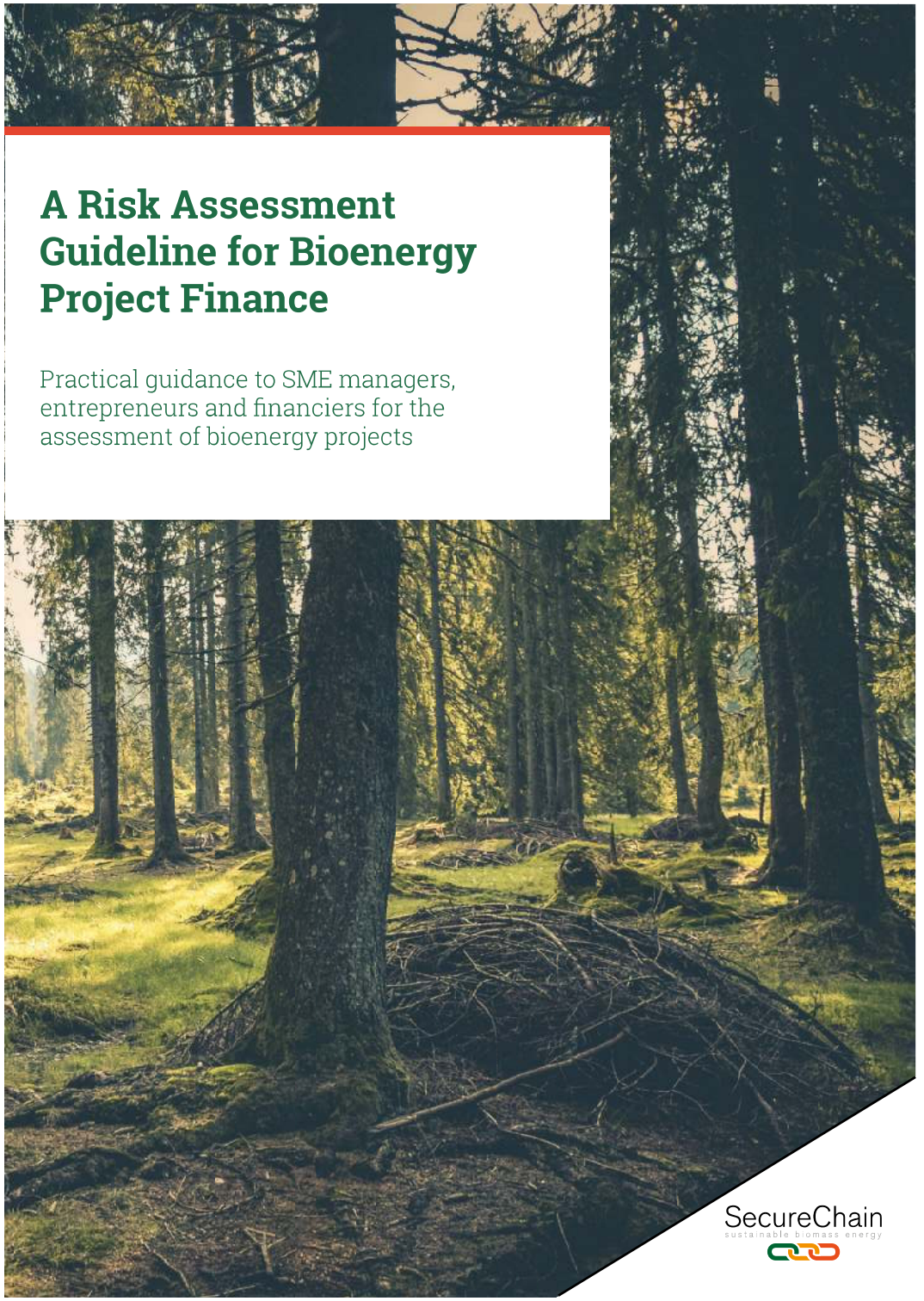
The project has received funding support from the European Commission Horizon 2020 under grant agreement no. 646457 from 01/04/2015 – 31/07/2018. It was coordinated by the BTG Biomass Technology Group BV in Enschede, The Netherlands.

Text by InnovaWood.



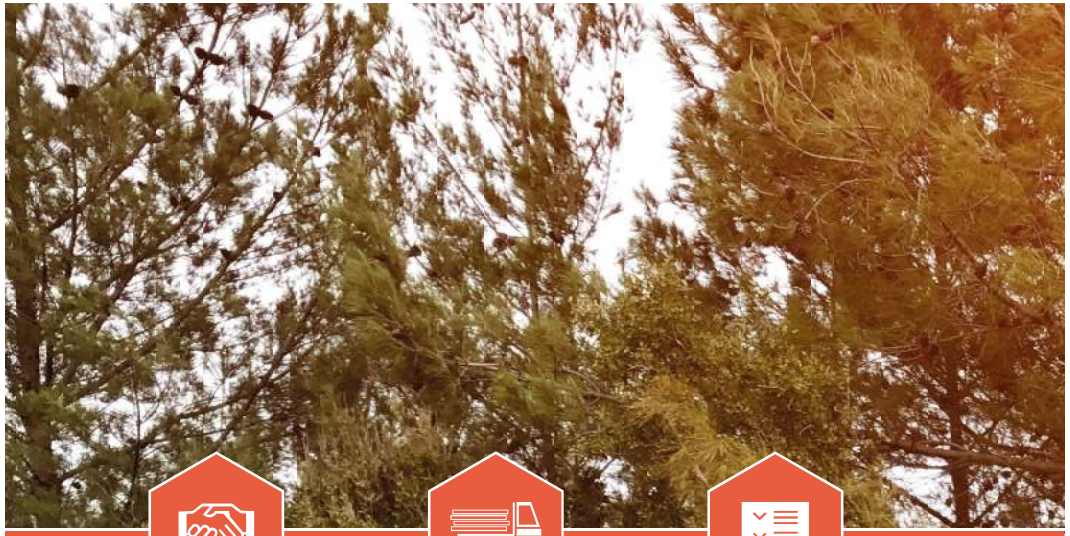
A Risk Assessment Guideline for Bioenergy Project Finance

Practical guidance to SME managers, entrepreneurs and financiers for the assessment of bioenergy projects



SecureChain
sustainable biomass energy

Small and medium enterprises are the core of the solid biomass to energy sector. What are the business opportunities in bioenergy and how can investments in sustainable supply chains be facilitated?



Secure Demand

"The key factor for reaching financial close was securing a long term off-take contract with a dairy company that acquires our biofuels"

Pyrolysis Plant CEO

Fuel Supply

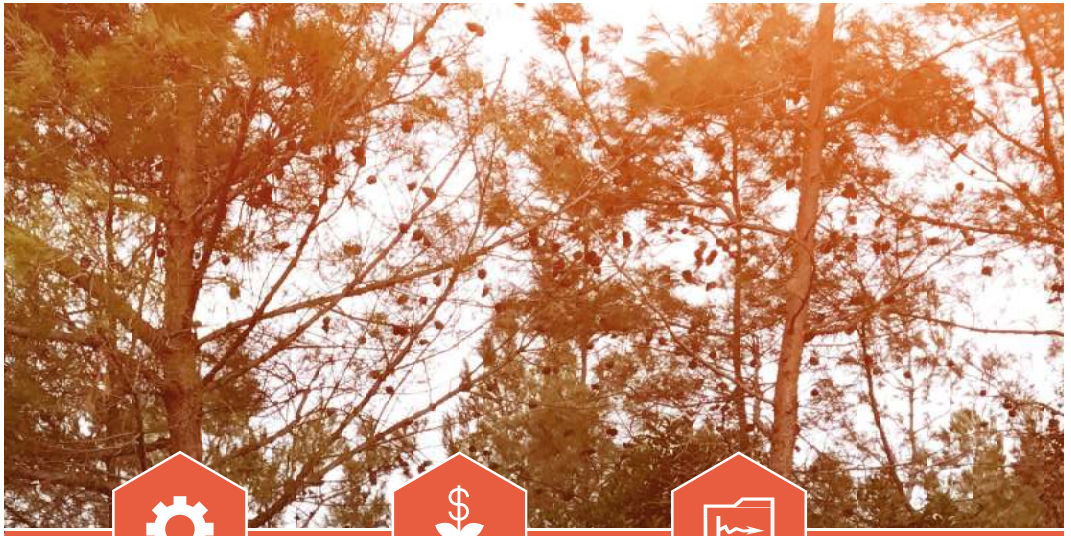
"Smaller Scale Projects with simple feedstock supply chains are easier to sell or finance"

A Bioenergy Project Development Consultant

Favourable Regulatory Framework

"Having a feed in tariff set at 0.18EUR kWh encouraged us to invest in a back up 180 kW CHP plant that operates in summer instead of the 2MW boiler".

A 2MW District Heating Network Manager from Austria



Project Design & Management

"The keys to financing are proper understanding of the technical feasibility of a biomass project and confidence in the choice of technology and the required O&M"

ESCO CEO in Catalonia

Cost of Capital

"For long-term agreements with municipal authorities, an internal rate of return as low as 10% would be considered attractive to invest in the project"

ESCO CEO in Catalonia

Price of substitute fuels

"Expecting cheap fossil fuels prices (diesel), procrastinates the decision to replace old boilers into more efficient biomass ones"

An owner from an 8MW CHP Plant in South Europe.

Successful fundraising tips. The SME perspective.

Build an outstanding business plan

State your ambition and identify the scale of the opportunity.

Do not allude to risks and challenges; turn them into the opportunity.

Prove that you possess the right skills and network.

- Absorbing Business Plan
- Credible Fact Sheet

Find the best sources of capital

Detail your financial needs; state how much capital is required, how it would be invested and when you plan to pay it back.

Demonstrate how risk is deleveraged and establish milestones.

Search for investors and lenders who target your portfolio of projects.

- Concise Investment Teaser
- Road Show Agenda

Formalize debt issuance or dilute your equity

Negotiate a term sheet that does not cannibalize your business plan principles.

Generate momentum simultaneously among different sources of capital.

Pick up the best funding sources, balancing committed liabilities and foreseeing the best partners for your journey.

- Signed Letter of Intent (LOI)
- Debt Agreement, Convertible Notes, Shareholders' Agreement

Choosing the right projects and deleveraging risks. The investor perspective.

Find outstanding and trustful people

Scale business ambition to reality and identify hidden values.

Consider whether risks and challenges could become entry barriers.

Verify that the team possesses the right skills and try to expand their network.

- Critically review Business Plan
- Define your investment thesis

Tie them to your investment thesis

Ensure that the opportunity is compatible with your capital allocation strategy and has a clear exit date.

Gear procurements and contingencies towards risk deleveraging.

Invest in what you understand; anticipate your potential exit strategies.

- Influence Investment Teasers

Commit to common objectives

Balance expected returns with the company's growth potential.

Co-invest with other funders with complementary investment theses.

- Signed Letter of Intend (LOI)
- Debt Agreement, Convertible Notes, Shareholders Agreement

Risks to consider and mitigation strategies

Risk Category	Risk Type	Mitigation Strategy
Fuel Supply	Biomass availability/ contract	Set out mid-term contract agreement with reliable suppliers, establishing quantities to deliver and pre-arranged prices.
	Biomass price	Assess and validate feedstock supply chain.
	Logistics implementation	Identify sources of biomass and delivery routes to plants.
Capital Expenditures	Technology choice and plant design	Incorporate Engineering, Procurement and Construction (EPC) partners.
	Project design & management	Adopt the Front-End Engineering Design (FEED) approach.
		Build an outstanding team and establish a governance model among participants.
	Land acquisition or usage	Be clear about ownership or terms of rent formalization.
	Construction	Ensure that the necessary permits and authorizations are in place.
	Grid connection	Obtain approval from national energy authorities.
Operation & Maintenance	Operations performance	Use modularity in production lines to facilitate flexibility of production and responsiveness to sudden changes in demand.
		Ensure that staff hold the appropriate qualifications.
		Size plants to reach saturation.
Price of Electricity or substitute fuels	Baseline Price of energy (opp. cost)	Minimize costs of self-produced heat and/or electricity. Negotiate electricity with utilities based on time-of-use tariffs, focusing self-consumption strategy on peak tariff periods.
Finance	Public-private arrangement	Negotiate long term Purchase Agreements (PA), such as Feed in Tariffs or ESCO services.
	Cost of capital	Conduct financial analysis to estimate returns and exit scenarios.
	Exchange rates	Analyze if insurance exchange can deleverages risk of supplies price volatility.
Policy Framework	Authorizations & legal aspects	Monitor developments in the pertinent legal framework.
	Planning constraints	Consider planning aspects from the start of project development. Engage local population early in the project.
Others	Environmental considerations	Use life-cycle assessment to scale emissions and other environmental aspects.
	Amenity issues & public acceptance	Conduct feasibility analysis of social acceptance, such as regional employment potential.
	Heat load rate	Prioritize those projects or clients with recurrent heat demand.

Title

A Risk Assessment Guideline for Bioenergy Project Finance

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Sustainability assessment of regional bioenergy case studies: review and testing of feasible criteria and indicators under a life cycle perspective

Gudrun Obersteiner [a], Silvia Scherhaufer [a, *], Uwe Kies [b], Sebastian Gollnow [a], Patrick Reumerman [c], Frederic Horta [d], Chrysovalantis Ketikidis [e], Pol Arranz Piera [d]

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Abstract: Biomass is the most important source for renewable energy in Europe and there is still potential to increase its contribution. Nevertheless, the sustainable use of biomass has to be assured to avoid critical impacts on environment, society and economy. Various sustainability criteria for biomass were proposed in recent years. To test their feasibility in practice, ten pilot cases from small and medium enterprises in five different regions in Europe were investigated, ranging from forest biomass supply to various energy conversion systems and wood ash recycling. This study tested the applicability of sustainability criteria in the context of specific implementation projects of local companies, and revealed gaps between theory and practice. Time constraints and limited data availability often prevented a quantitative assessment of criteria, which is why more qualitative assessments needed to be considered, so that any relevant criteria were not overlooked. Quantitative assessments of GHG emissions of a given bioenergy chain was enabled to some extent by the use of default values from literature. However, the use of default values cannot fully replace calculations of lifecycle GHG emissions by means of LCA, which is one of the most efficient options to determine environmental bottlenecks in bioenergy systems.

Keywords: solid biomass, bioenergy, sustainability, LCA, forestry residues, landscape elements, energy crops, life cycle, assessment criteria, case study

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IMPORTÀNCIA DE LA BIOMASSA FORESTAL EN EL MERCAT DELS BIOCOMBUSTIBLES PER A USOS ENERGÈTICS[1]

Pere Navarro, Adriano Raddi i Mireia Codina

Àrea d'Aprofitaments Fusters i Biomassa -
Centre Tecnològic Forestal de Catalunya (CTFC)

Rebut: 1 de juny de 2017 - Acceptat: 30 de juny de 2017

RESUM

La bioenergia és energia produïda a partir de fonts biològiques renovables com la biomassa. La biomassa és un material d'origen biològic que es pot convertir en combustible (biocombustible) per a subministrar calor i electricitat. La bioenergia es pot obtenir de moltes formes de biocombustibles. Aquests inclouen els biocombustibles sòlids forestals, com són l'estella, el pèl·let, la llenya i les briquetes. El mercat de la biomassa es va implementant a Catalunya, cada cop més. De fet, les tendències d'aprofitament i d'ús de la biomassa forestal s'incrementen a mesura que es desenvolupa.

Paraules clau: bioenergia, biomassa forestal, mercat, biocombustibles sòlids, bioeconomia, estella, pèl·lets, llenya.

Correspondència: Pere Navarro. Àrea d'Aprofitaments Fusters i Biomassa, Centre Tecnològic Forestal de Catalunya. Ctra. Vella de Sant Llorenç, km 2. 25280 Solsona (Lleida). Tel.: (+34) 973 48 17 52, ext. 301. A/e: *pere.navarro@ctfc.cat*.

1. Article elaborat en el marc del projecte SECURECHAIN. Projecte d'energia renovable finançat pel programa de la Unió Europea Horitzó 2020 per al període 01.04.2015 - 31.03.2018. L'objectiu principal és promoure les cadenes sostenibles de bioenergia a la zona rural, que compleixen normes mediambientals elevades i són econòmicament viables per a les petites i mitjanes empreses (pime).

P. Navarro, A. Raddi, M. Codina

IMPORTANCIA DE LA BIOMASA FORESTAL EN EL MERCADO DE LOS BIOCOMBUSTIBLES PARA USOS ENERGÉTICOS

RESUMEN

La bioenergía es energía producida a partir de fuentes biológicas renovables como la biomasa. La biomasa es un material de origen biológico que se puede convertir en combustible (biocombustible) para suministrar calor y electricidad. La bioenergía se puede obtener de muchas formas de biocombustibles. Estos incluyen los biocombustibles sólidos forestales, como son la astilla, el pelet, la leña y las briquetas. El mercado de la biomasa se está implementando en Cataluña, cada vez más. De hecho, las tendencias de aprovechamiento y de uso de la biomasa forestal se incrementan a medida que se desarrolla.

Palabras clave: bioenergía, biomasa forestal, mercado, biocombustibles sólidos, bioeconomía, astilla, pelets, leña.

IMPORTANCE OF FOREST BIOMASS IN THE ENERGY BIOFUELS MARKET

ABSTRACT

Bioenergy is energy produced from renewable biological sources such as biomass. For its part, biomass is a biological material that can be turned into fuel (biofuel) to supply heat and electricity.

Bioenergy can be obtained from many forms of biofuels. These include solid forest biofuels such as woodchips, pellets, firewood and briquettes. The biomass market is undergoing increasing implementation in Catalonia. In fact, the trends in the exploitation and use of forest biomass are rising in step with its development.

Keywords: bioenergy, forest biomass, market, solid biofuels, bioeconomy, woodchips, pellets, firewood.

1. INTRODUCCIÓ

Durant els últims temps, el sector agrícola i forestal s'ha trobat al centre del debat a causa de dos conceptes clau que tenen molt èxit en termes de comunicació: la *bioeconomia* i l'*economia circular*, ambdós avalats per les polítiques de desenvolupament de la Unió Europea.

3.2 SecureChain final dissemination events

3.2.1 SecureChain Final Conference "Small and Medium Enterprises in Bioenergy: Boosting Rural Employment and Sustainable Biomass Mobilisation"

Date, venue, host, link
7/6/2018, Brussels, Belgium
Hosts: BTG, CTFC, Secure Chain consortium partners

Registered event of the 18th European Sustainable Energy Week (EUSEW)

Attendance
The SecureChain Final Event was attended by 44 people, representing a wide range of stakeholders, including the **European Commission**, **decision makers** (ACCIO from Catalunya, Catalan Agency for Competitiveness, StartGreenCapital, etc), **academia** (Technical University of Thessaly, Greece, Technical University of Cologne, Germany, etc), **local authorities** (Uppvidinge kommun, Sweden) **or private sector** (AEBIOM, AIGUSASOL, etc)

Topics and outcome
The Final Conference of the SecureChain project aimed at promoting the role of small and medium enterprises (SMEs) of the solid biomass - to - energy sector in fostering innovation and growth in rural areas in view of the emerging bioeconomy. The main objectives of the event were to:

- Showcase the potential of SMEs for stimulating innovation and employment in sustainable bioenergy in rural regions;
- Discuss lessons learnt from various support and mentoring approaches for SMEs: innovation vouchers, cluster initiatives, networks, and outreach programmes;
- Highlight the benefits and challenges of national and international support schemes for fostering market uptake and collaboration in bioenergy value chains.

The conference was hosted by the SecureChain consortium and co-organized as a joint event together with other H2020 projects. Through an interaction of interventions and presentations, the Final Event provided the opportunity of ideintifying key elements of bioenergy in the various cases and reaffirm the perspectives that bioenergy represents in the near future, in the framework of the climate mitigation efforts to green the entire economy.

The presence of MEP provided the high political endorsement for the event, while the representative of the European Commission put the emphasis on the trends and perspectives that bioenergy carries within the framework of the European Union.

A general framework of the innovative nature of SecureChain set the agenda for the rest of the day: “Mentoring innovation in SMEs to foster bioenergy market uptake” was presented by Uwe Kies, Coordinator of SecureChain in behalf of Biomass Technology Group (BTG), NL.

The session “Small but smart: How entrepreneurs seize bioenergy market opportunities to innovate” provided testimonials from local bioenergy projects:

- Decarbonisation of local communities through bioenergy in Småland Göran Gustavsson, Energy Agency of South East Sweden, Växjö, Sweden
- Biomass district heating and cooling networks : experiences in Catalonia Oriol Gavaldà, Aiguasol, Spain
- Biomass recovery from waste – the AVEA company case Pascal Beese-Vasbender, Bergischer Abfallwirtschaftsverband (BAV), Germany

The following two sessions provided a closer look to the financial and environmental sustainability of bioenergy investments:

- Financing Market Uptake in Bioenergy: Risk Assessment, introduced by Pol Arranz & Fric Horta from the Universitat Politècnica de Catalunya (UPC), Spain
- LCA-based Sustainability Assessment of Bioenergy Chains session, presented by Gudrun Obersteiner, University of Natural resources and Life Sciences, Institute of Waste Management (ABF-BOKU), Austria

The first Part of the Final Event ended with a wrap – up presented by Mr. Patrick Reumerman, from the Lead Partner BTG, focusing on the initial conclusions and the discussion statement on the Bioenergy Market Uptake in SMEs



The 2nd part of the day included 2 panel discussions. Panel 1 focused on the market uptake of regional perspectives and approaches, presenting lessons learnt from other bioenergy projects:

- Biomass mobilisation for the emerging bioeconomy. BIO4ECO project, presented by Adriano Raddi, CTFC Forest Science Centre of Catalonia, Spain
- Up_Running: Success cases for mobilization of wood from agricultural prunings. presented by Manolis Karampinis, CERTH Centre for Research and Technology Hellas, Greece
- Biomass from marginal land and Bioenergy Villages: FORBIO and BioVill, presented by Dominik Rutz, WIP Renewable Energies, Germany

Panel 2 tackled the widening of the market uptake of bioenergy, through the views of stakeholders consisting this 2nd panel: Anna Martin, AEBIOM European Biomass Association, Belgium Åke Carlson, Mayor of Uppvidinge, Småland Sweden.

All presentations are accessible on the conference website:
www.securechain.eu/conference

Small and Medium Enterprises in Bioenergy: Boosting Rural Employment and Sustainable Biomass Mobilisation

Final Conference

Date: 7 June 2018, 9:00 - 16:00

Venue: Generalitat de Catalunya Government of Catalonia

Rue de la Loi / Wetstraat 227, 1040 Brussels (Schuman), Belgium

Hosted by:

Project from 2015-2018 with funding from the EU Horizon 2020 research and innovation programme under grant agreement no. 646457

www.securechain.eu

Conference objective

The solid biomass to energy sector is dominated by small and medium enterprises. What is and can be their role in fostering innovation and growth in rural areas in view of the emerging bioeconomy? The main objectives of the event are to:

- ***Showcase the potential of SMEs*** for stimulating innovation and employment in sustainable bioenergy in rural regions;
- Discuss lessons learnt from various ***support and mentoring approaches for SMEs***: innovation vouchers, clusters, networks, and outreach programmes;
- Highlight the benefits and challenges of ***national and international programmes*** for fostering market uptake and collaboration in bioenergy chains.

The conference will bring together professionals and stakeholders in bioenergy, notably SME managers, experts, advisors, financiers and decision-makers.

The conference is hosted by the SecureChain consortium to offer a platform for various experts representing H2020 projects and regions in the bioenergy sector.

It is a registered event of the 18th European Sustainable Energy Week (EUSEW) and is held at a nice venue close the European Commission (Schuman).

SUSTAINABLE ENERGY WEEK
An initiative of the European Commission

Further information & Registration

Participation is free of charge and open to all. However, registration is required, through the conference webpage at www.securechain.eu/conference

In case of questions please contact one of the conference organisers:

btg biomass technology group

BTG Biomass Technology Group BV, The Netherlands
email: vos@btgworld.com / phone: +31 53 486 11 91

CTFC

CTFC Forest Sciences Centre of Catalonia, Spain
email: carla.bellera@ctfc.es / phone: +34 973 48 1752 326

Small and Medium Enterprises in Bioenergy: Boosting Rural Employment and Sustainable Biomass Mobilisation

Conference programme

Moderator: Claire Doole, Doole Communications, Switzerland

Time	*Topic, Presentation, Speaker*
09:00	Registration
9:30 (0:20)	**Opening** • Words of welcome MEP Ramon Tremosa i Balcells, Member of the European Parliament Committee on Economic and Monetary Affairs Patrick Reumerman, BTG Biomass Technology Group, The Netherlands • European bioenergy research and innovation policies and the Energy Union Dr Maria Georgiadou, Senior Policy Officer, European Commission, DG Research & Innovation
9:50 (0:20)	**Mentoring innovation in SMEs to foster bioenergy market uptake** • Lessons learnt from the SecureChain innovation voucher contest Uwe Kies, InnovaWood, Belgium / BTG, The Netherlands
10:10 (0:50)	**Small but smart: How companies can seize bioenergy market opportunities to innovate** Testimonials from local bioenergy projects (3 statements, each 10 min) • Decarbonisation of local communities through bioenergy in Småland Göran Gustavsson, Energy Agency of South East Sweden, Växjö, Sweden • Biomass district heating and cooling networks : experiences in Catalonia Oriol Gavaldà, Aiguasol, Spain • Biomass recovery from waste – the AVEA company case Pascal Beese-Vasbender, Bergischer Abfallwirtschaftsverband (BAV), Germany • Questions & Answers (ca. 20 min)

Time	*Topic, Presentation, Speaker*
11:00	Coffee break
11:30 (0:20)	**Financing Market Uptake in Bioenergy: Risk Assessment** Pol Arranz & Frederic Horta, UPC Universitat Politècnica de Catalunya, Spain
11:50 (0:20)	**LCA-based Sustainability Assessment of Bioenergy Chains** Gudrun Obersteiner, BOKU-ABF, Vienna, Austria
12:10 (0:35)	**Bioenergy Market Uptake in SMEs: Initial Conclusions & Discussion** Patrick Reumerman, BTG Biomass Technology Group, The Netherlands • Questions and Answers (ca. 25 min)
12:45	Lunch break
14:00 (0:40)	**Panel 1: Market Uptake Regional Perspectives & Approaches** Lessons learnt from other bioenergy projects (ca. 10-15 min each). • Biomass mobilisation for the emerging bioeconomy. BIO4ECO project Adriano Raddi, CTFC Forest Science Centre of Catalonia, Spain • Up_Running: Success cases for mobilization of wood from agricultural prunings. Manolis Karampinis, CERTH Centre for Research and Technology Hellas, Greece • Biomass from marginal land and Bioenergy Villages: FORBIO and BioVill Dominik Rutz, WIP Renewable Energies, Germany
14:40 (1:10)	**Panel 2: Widening Market Uptake of Bioenergy** Views from stakeholders (panel including the three previous speakers) Anna Martin, AEBIOM European Biomass Association, Belgium Åke Carlson, Mayor of Uppvidinge, Småland Sweden
15:50 (0:10)	**Closing Statement** Patrick Reumerman, Biomass Technology Group (BTG), The Netherlands
16:00	End of conference & Informal Get Together Cocktail (Catalan Cava)

SecureChain
sustainable biomass energy

Future-proof local bioenergy chains - Project summary

SecureChain.eu promotes market uptake of bioenergy by supporting SMEs in six European model regions through a dedicated innovation mentoring approach, targeting the entire bioenergy chain. Key activities and outcomes include:

- *Innovation Vouchers*: In an open contest, SMEs submitted various own ideas for improvement. The best 20 SME pilot projects were selected and received specific technical and financial advice from the project.
- *Learning Labs* and various trainings raised capabilities of SME pilot project owners and ensured wider stakeholder engagement in the regions.
- *Life Cycle Assessments* (LCAs) evaluated the sustainability impacts of 13 pilots. *Certification* trainings and pre-checks led already to 5 successful certifications.
- *Financial risk assessment and advisory services* to SMEs have led to increased production and new investments into facilities and equipment.

The project shows positive impacts on all assessed SMART criteria. The final event will showcase these results and provide also a platform for the following partner projects:

BIO4ECO Interreg Europe — Sustainable regional bioenergy policies: a game changer - www.interregeurope.eu/bio4eco

greenGain.eu — Biomass from landscape conservation and maintenance work for renewable energy production - https://greengain.eu

uP_running — Take-off for sustainable supply of woody biomass from agrarian pruning and plantation removal - www.up-running.eu

FORBIO — Fostering sustainable feedstock production for advanced biofuels on underutilized land in Europe - www.forbio-project.eu

BioVill — Bioenergy Villages. Increasing the market uptake of sustainable bioenergy - www.biovill.eu

Speakers and panelists

Claire Doole is an internationally sought after moderator, with a track record in moderating lively panel discussions at the highest level. She is a former BBC journalist and international spokeswoman who is passionate about helping people communicate with confidence.

Maria Georgiadou is Senior Policy Officer in 'Renewable Energy Sources' in the European Commission Directorate-General for Research and Innovation. She heads the strategic orientation and development of research and innovation programmes and policies in the fields of Renewable fuels and Bioenergy. She worked in R&D at universities and institutes in USA, Greece, France and Belgium, and for Ernst & Young.

Ramon Tremosa i Balcells is a Member of the European Parliament Committee on Economic and Monetary Affairs. He is an independent MEP for the Partit Demòcrata. He was a Senior lecturer in the Department of Economic Theory, University of Barcelona. He has published several books on the political case of Catalonia.

Patrick Reumerman is senior consultant at BTG Biomass Technology Group. He is specialist for biomass and waste conversion technologies and an expert on feasibility studies, technology selections, due diligence studies and market analyses on various bio-energy applications. He coordinates a number of national and EU bioenergy R&D projects, including SecureChain.

Uwe Kies is an experienced EU project manager and advisor specialised in forestry, wood industries and bioenergy. He is Secretary General of InnovaWood - European Network for Research, Innovation, Education and Training in the Forest-based Sector. He coordinates various European initiatives and R&D actions, e.g. the SecureChain project.

Göran Gustavsson is project manager and bioenergy expert at Energy Agency of Southeast Sweden AB. He coordinates the regional network 'Bioenergy Group of Växjö' where value chain members cooperate to create new business in bioenergy. He presents the results of pilots in Southeast Sweden.

Oriol Gavaldà i Torrelles is senior industry consultant and head of R&D at AIGUASOL, Spain. His key competences include Sustainable urban planning, Building physics applied to passive designs, Building physics research activities. He has worked as field engineer in several execution and consultancy projects in energy efficiency, mainly in tertiary and industrial sectors. He presents an innovative district heating network pilot project in Olot, Girona.

Pascal Beese-Vasbender is project manager at the Bergische Waste Management Association (BAV), Germany, which established the project cluster :metabolon focusing on innovative environmental technologies and sustainable resource management. He holds the view that nature keeps solutions ready for the current social challenges, but that we must take a closer look into natural processes to discover them. He presents the AVEA pilot project in NRW, Germany.

Pol Arranz-Piera is a researcher at Universitat Politècnica de Catalunya (UPC). specialising on biomass to energy supply chain analysis. He has experience in renewable energy engineering (biomass systems, PV systems, hybrid systems, microgrids) including technical and financial design, implementation, monitoring and evaluation. He is an experienced consultant in international cooperation.

Frederic Horta is associate lecturer and researcher at Universitat Politècnica de Catalunya (UPC). He is specialist in microeconomics, fund raising, business development and technology transfer in international projects. He lectures fundamentals of economics and entrepreneurship at UPC. He presents SecureChain's financial risk analysis and mentoring approach for SMEs.

Gudrun Obersteiner is senior scientist at and managing director of the Institute of Waste Management at BOKU University of Natural Resources and Applied Life Sciences in Vienna. She is an internationally recognized expert in waste management and environmental management, waste collection systems, waste prevention, recycling technologies and methods for decision-making in waste management.

Adriano Raddi is the head of bioeconomy and governance programme at CTFC Forest Science and Technology Center of Catalonia. His expertise is in of decision-making processes and the economy applied to the forestry sector. His also works on forest products value chains and on a holistic and strategic vision. He presents the BIO4ECO project.

Manolis Karampinis is a research associate at Centre for Research and Technology Hellas (CERTH) working on solid biofuels mobilization and utilization. He is representing the H2020 market update projects BIOmasud Plus and uP_running, leading the establishment of an Observatory for agricultural pruning and plantation removal biomass.

Dominik Rutz a specialist in bioenergy and Head of the Bioenergy & Bioeconomy Unit at WIP Renewable Energies, Germany. His main field of experience includes the technical and non-technical analysis of bioenergy and its supporting policies. Engaged in a variety of energy-related European projects, he presents lessons learnt from the bioenergy projects FORBIO and BioVill.

Anna Martin works in the Policy Team of the AEBIOM European Biomass Association where she is in charge of Sustainability, Bioeconomy and Cascading of woody biomass. She has worked on environmental and climate policy at the General Secretariat of the Council of the European Union.

Åke Carlson is chairman (mayor) of Uppvidinge, a municipality in the County of Kronoberg, a heavily forested region in Southern Sweden. He is a fervent advocate to strengthen the role of private forest owners and their contribution to sustainable, local communities and the green economy.

3.2.2 SecureChain Finance Day

Date, venue, host, link
6/6/2018, Brussels, Belgium
Hosts: CBI Climate Bonds Initiative, UPC Polytechnic University of Catalonia

Attendance
The SecureChain Finance Day was attended by 29 people, representing a wide range of stakeholders, including the European Commission, key players from the wider finance sector, (ACCIO from Catalunya, Catalan Agency for Competitiveness, StartGreenCapital, etc), academia (Technical University of Thessaly, Greece, Technical University of Cologne, Germany, etc), Local authorities (Uppvidinge kommun, Sweden) or private sector (AEBIOM, AIGUSASOL, etc)

Topics and outcome
The Finance Day was the first day of the Final Conference of the H2020 SecureChain consortium and was co-organised by the Climate Bonds Initiative and Universitat Politecnica Catalunya. The event aimed to bring together SME professionals and financiers in bioenergy to:

- Present lessons learnt for SMEs on accessing finance for bioenergy projects
- Investigate the challenges and opportunities of SME financing for bioenergy projects
- Explore green finance instruments to access funding for sustainable bioenergy projects

Through an interaction of interventions and presentations, the Finance Day gave the participants the opportunity to get a first-hand experience of the potential for financing energy projects and the perspectives that bioenergy represents in the near future, in the framework of the climate mitigation efforts to green the entire economy. The event was articulated in the two following Panels.

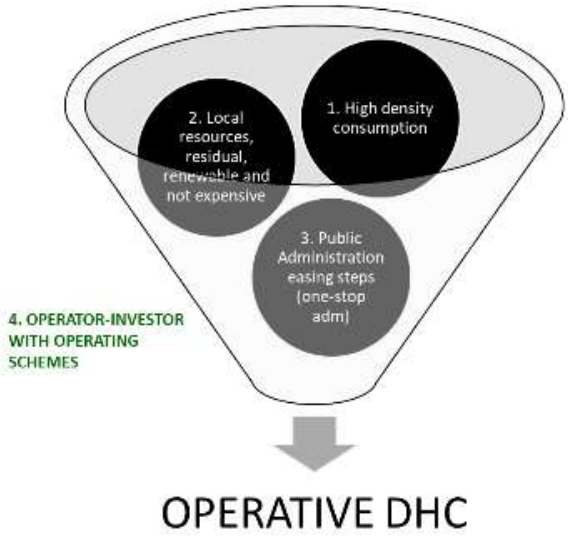
Panel 1: Market opportunities and company success stories

The session was aimed at discussing 3 SME experiences in developing bioenergy projects, with special emphasis on the financing mechanisms applied.

AIGUASOL presented the case of District Heating and Cooling (DHC) networks in Catalonia. There are a total of 118 networks with a total installed power of 442 MW. Of these 118 networks 111 are heating networks while the rest, 7, are heating and cooling networks. The total installed heat and cold power is 265.8 MW and 175.7 MW, respectively. Of the networks installed in Catalonia, 95% have, at least, a source of

renewable energy. 85% of total networks use renewable energy sources combined with other sources of energy. Within this last group, especially, networks that use biomass, represent 55% of the total installed networks.

In terms of the ownership of these networks, 59% of the networks registered in 2016 in Catalonia are publicly owned, representing, in terms of installed capacity, 8.6%. 34% of the networks belonging to private entities - equivalent to 3.8% of the installed capacity - and the remaining 7% of the networks are of mixed ownership. However, the latter represent large-scale projects, with 87.6% of the total installed capacity. The following aspects are identified to be key in the operation of DHC networks:



Regarding O&M types of contracts, the following options are in use in Catalonia:

1. Management agreements (part of the management is externalised, whilst ownership and financial decisions keep in hands of the public sector)
2. Rent contracts (a private company takes control of operation and management of a network, with a previous payment of a rent to public administration, whichs keeps ownership)
3. “Heat entrepreneurship” (it consists of involving the wood supplier as an actor, including them in a mix company, and having a cooperative company starting the business),
4. ESCO model (more common lately, an Energy Service Company, who is in charge of giving a service to final users of energy)

Those schemes used to manage the plants BLT (Build Lease Transfer), el BOO (Build Own Operate), el BOOT (Build Own Operate Transfer), el BOT (Build Operate Transfer), el BRT (Build Rent Transfer), el D & B (Design and Build), el DBFO (Design Build Finance Operate), el PFI (Private Finance Initiative), o el FBOOT (Finance Build Own Operate Transfer).

The case of national funds for SMEs in Sweden was discussed by Bioenergy Group Ltd. ”Klimatklivet” is a national funding scheme with the purpose to decrease the emissions of GHG. The first call was opened 2015. Annually, four calls are open for applications to subsidise investments in areas such as transport, industry, residential, commercial, urban development and energy. Schemes may involve, for example, replacing fossil oil with biofuel or construction of filling stations for renewable fuels for vehicles. The scheme may finance up to 70 % of the investment, both for public actors as well as private actors (like SMEs). Since 2015, close to 2000 actions have been funded, and more than 70 percent of funds go to private companies. Actions have been granted so far for 300 MEURO, to subsidise investments to a total value of 700 MEURO. And the scheme has been extended to 2020 for new applications.

The last presentation by Prof. Ntalos from the University of Larissa, Greece, gave an overview of the market options for SMEs in Greece. Big investors are prospecting the creation of Biomass small power plants in the next two - five years. It must be noted than in Greece the agricultural sector constitutes more than 5% of GNP, almost the triple of mean of 1.8% European Union. Consequently, the companies that deal with biomass can find abundant sources of raw material which can also gain from the cultivation of energy plants.

Even if the economic situation of country does not encourage international private investment, now is observed a shift of interest in the Biomass. Small and Medium sized plants (from 50kW up to 1 MW) are now commercial and are being considered by investors because they can be supplied from the locally available (and dispersed) biomass resources. As the best technology for the most cases, Gasification in combination with Engine of Internal Combustion is being considered. The advantages of equipment of this technology are his simplicity of application, the comfortable management, the possibility of using a lot of types of raw material, sizes and qualities of Biomass, its easy service and his relatively low cost.

The first panel finalized with an open question and answer time, which mostly revolved around the influence of background polices in de-risking investment prospectuses for SME, and the importance of demonstrating viable projects by entrepreneur SMEs in order to pull the interest of investors into those SMEs activities.

Panel 2: Financial sector perspective on bioenergy

The session was aimed at exploring the challenges and opportunities of bioenergy financing, with a particular focus on what investors are looking for.

Financing of bioenergy and biomass projects can be an issue due to the fact that these projects can appear more expensive than other technologies if 1. The whole lifecycle of the project (capital and operation expenditure) is not taken into account, and 2. External impacts such as pollution and other sustainability considerations are not integrated into the costs. Policy has a strong role to play in making bioenergy projects viable, especially when it comes to their pricing: fossil fuel subsidies, emissions regulations, low oil prices and carbon taxes can hamper or boost bioenergy projects. Bioenergy projects also face challenges due to the limited expertise in the banking sector to assess the risk and therefore generate loans that reflect the risk/return profile of the project. Financial participation of consumers is an important innovation in this field but this is not always allowed by legislation.

Crowdfunding, venture capital and regional energy funds have an important role to play in providing seed capital and project growth funding to bioenergy projects. Renewable energy funds vary in size and can be as small as >Euro 10m to <EUR 80m. However, investments by these funds need to be equally matched by private investments so energy projects have to meet select criteria to be able to be included, such as: proven technology, solid financial return, direct contribution to energy transition, low default risk, long-term arrangements and solid feedstock take-off contracts. It can be challenging to find projects at the right level of maturity, with all permits and co-financing in place and led by a skilled and diverse team. It is also important that debt and equity providers need to coordinate from early stages of project preparation.

Institutional investors are increasingly interested in green and sustainable investments as is shown by the rapid growth of the green bond market; how can we tap into this growing demand to fund small-scale bioenergy projects? Under the Climate Bonds Standard, bioenergy criteria have been developed to support the identification of bioenergy assets for green bonds and green loans that meet both mitigation and adaptation needs. Banks and other financial institutions can aggregate their lending to issue green bonds and raise capital for fresh loans, confident of the demand for green debt instruments.

Finance Day: Financing future-proof low impact bioenergy chains

Roadshow Event

Date: 6 June 2018, 12:30 - 16:30

Venue: Generalitat de Catalunya Government of Catalonia

Rue de la Loi / Wetstraat 227, 1040 Brussels (Schuman), Belgium

Hosted by:

SecureChain sustainable biomass energy

Climate Bonds Initiative

UPC Universitat Politècnica de Catalunya BarcelonaTech

CTFC

Project from 2015-2018 with funding from the EU Horizon 2020 research and innovation programme under grant agreement no. 646457

www.securechain.eu

Sustainable Energy Week

Objective

Small and medium enterprises are the core of the solid biomass to energy sector. What are the business opportunities in bioenergy and how can investments in sustainable supply chains be facilitated? The main objectives of the event are:

- Present *lessons learnt from SMEs* on accessing finance for bioenergy projects
- Investigate the *risks and opportunities* of SME financing for bioenergy market uptake projects
- Explore *green finance instruments* to access funding for sustainable bioenergy

The Finance Day brings together experts and representatives from the industry and the financial sector. The conference is hosted by the Climate Bonds Initiative and the Universitat Politècnica de Catalunya on behalf of the SecureChain project.

It is a registered event of the 18th European Sustainable Energy Week (EUSEW) https://eusew.eu and is held at a venue close the European Commission (Schuman).

Further information & Registration

Participation is free of charge and open to all. However, registration is required, through the conference webpage at www.securechain.eu/financeday

In case of questions please contact one of the conference organisers:

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email: diletta.giuliani@climatebonds.net / phone: +44 7786698451

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UPC Universitat Politècnica de Catalunya
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Finance Day: Financing future-proof low impact bioenergy chains

Time	*Topic, Presentation, Speaker*
12:30	Registration & Light Lunch
13:30 (0:15)	**Opening & words of welcome** Ana Coelho, Director of Catalonia Trade&Investment Brussels, Government of Catalonia Pol Arranz, Universitat Politècnica de Catalunya, Barcelona Tech
13:45 (1:00)	**1st Panel: Market opportunities and company success stories** Moderator: Pol Arranz, Universitat Politècnica de Catalunya, Barcelona Tech • Financing schemes for biomass district heating and cooling (DHC) networks – case study in Olot, La Garrotxa (Catalonia). Oriol Gavaldà, Aiguasol, Barcelona • Bioenergy uptake through national energy funds in Småland Göran Gustavsson, Bioenergy Group Ltd, Växjö, Sweden • Market opportunities and sustainable bioenergy financing in Greece Prof. Georgios Ntalos, Technical Educational Institute of Larissa, Department of Wood and Furniture • Questions & Answers
14:45	Coffee break
15:15 (1:00)	**2nd Panel: Financial sector perspective on bioenergy** Moderator : Serena Vento, Climate Bonds Initiative, London, UK • Challenges for financing bioenergy and biomass projects Dominik Rutz, WIP Renewable Energies, Germany • Green bonds and green loans for bioenergy– State of the market Matteo Bigoni, Climate Bonds Initiative

Time	*Topic, Presentation, Speaker*
	• Regional Energy Fund for Bioenergy and Other Renewables Karel Asselbergs, Regional Energy Fund Overijssel, NL
16:15 (0:15)	**Wrap up: Take-home messages and closing statement** Serena Vento, Climate Bonds Initiative, and Frederic Horta, Universitat Politècnica de Catalunya
16:30	Cocktail reception (Catalan Cava)

Project summary: Financing of sustainable bioenergy chains

SecureChain.eu promotes market uptake of bioenergy by supporting SMEs in six European model regions through a dedicated innovation mentoring approach, targeting the entire bioenergy chain. Key activities and outcomes include:

- *Innovation Vouchers*: In an open contest, SMEs submitted various own ideas for improvement. The best 20 SME pilot projects were selected and received specific technical and financial advice from the project.
- *Learning Labs* and various trainings raised capabilities of SME pilot project owners and ensured wider stakeholder engagement in the regions.
- *Life Cycle Assessments* (LCAs) evaluated the sustainability impacts of 13 pilots. *Certification* trainings and pre-checks led already to 5 successful certifications.
- *Financial risk assessment and advisory services* to SMEs have led to increased production and new investments into facilities and equipment.