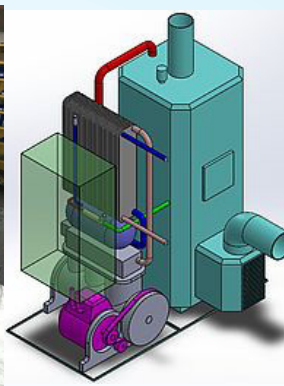
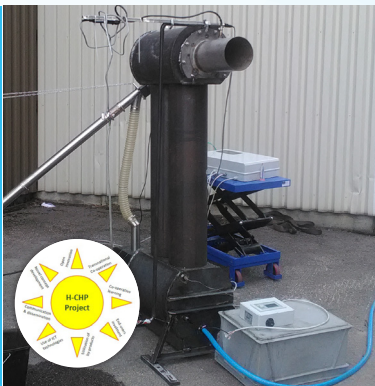


H-CHP

WORKSHOPS FOR PROFESSIONALS

Lapland Hotel,
Oulu, Finland

9 September 2019



UNIVERSITY OF OULU
KERTTU SAALASTI INSTITUTE

FMT

FUTURE MANUFACTURING
TECHNOLOGIES

Workshop Schedule

09.00 - 09.15	Arrivals and registration
09.15 - 09.30	Introductions
09.30 - 10.00	Outline of H-CHP concept
10.00 - 10.30	Presentation of equipment
10.30 - 10.50	Q & A with engineers
10.50 - 11.10	Coffee break
11.10 - 11.30	Legislative framework and permissions
11.30 - 11.50	Network arrangements
11.50 - 12.10	Supply chains and potential for fuel
12.10 - 12.30	Roundtable discussion
12.30 - 13.30	Lunch and close

Työpajan aikataulu

09.00 - 09.15	Ilmoittautuminen
09.15 - 09.30	Esittely
09.30 - 10.00	H-CHP-konseptin kuvaus
10.00 - 10.30	Laitteiden esittely
10.30 - 10.50	Q & A insinöörien kanssa
10.50 - 11.10	Kahvitauko
11.10 - 11.30	Lainsäädäntökehys ja käyttöoikeudet
11.30 - 11.50	Sähköverkkoon liitettävyys
11.50 - 12.10	Toimitusketjut ja polttoaineen saatavuus
12.10 - 12.30	Pyöreän pöydän keskustelu
12.30 - 13.30	Lounas ja tilaisuuden päätös

About the workshops

The purpose of our workshops is to raise awareness of Household Combined Heat and Power (H-CHP) and to engage with stakeholders. Professional stakeholders will be able to gain an understanding of H-CHP, feed into the programme and support its development. We aim to engage those with an interest in CHP at a household and community level, considering energy production and reduction in the home, use of biofuels, synthetic gas and promote new and current supply chains.

H-CHP can revolutionise energy use in the home, particularly for those who are off grid or in remote and sparsely populated areas. H-CHP is a tool in the fight against climate change.

The workshops will cover:

- Presentation of H-CHP concept
- Presentation of H-CHP equipment
- Meet the engineers and project team
- Results from testing of gasification
- Results from H-CHP units
- Use of H-CHP
- Feed into Toolkit development
- Feed into Community Guide development
- Open source access to H-CHP design

The workshops will be essential for:

- Energy companies
- Regulators
- Municipalities
- CHP companies / manufacturers
- Fuel suppliers of biomass
- Academics
- Architects
- Engineers
- Energy efficiency specialists

There will be an opportunity to question engineers from the H-CHP team in person and by VCR during the workshops. Equipment will be made available in physical and virtual form. The team are developing a toolkit and community guide. The workshops will give an opportunity to feed into these, to ultimately benefit the communities which you serve.

Tietoa työpajoista

Työpajamme tarkoituksena on lisätä tietoisuutta kotitalouksien lämmön ja sähkön yhteistuotannosta sekä tehdä yhteistyötä sidosryhmien kanssa. Ammatilliset sidosryhmät saavat käsityksen H-CHP:stä, voivat antaa palautetta sisällöstä ja tukea kehittämistä. Tavoitteenamme on aktivoida CHP:stä kiinnostuneita kotitalouksia ja yhteisöjä, jotka pohtivat energiakulutuksen vähentämistä, ja ovat kiinnostuneita biopolttoaineiden ja synteettisten kaasujen käytöstä energialähteenä, sekä haluavat kehittää uusia ja nykyisiä toimitusketjuja.

H-CHP voi mullistaa kotitalouksien energiankäytön etenkin niille, jotka asuvat syrjäisillä ja harvaan asutuilla alueilla, tai eivät kuulu sähköverkkoon. H-CHP on väline ilmastonmuutoksen torjunnassa.

Työpajat kattavat:

- H-CHP-konseptin esittely
- H-CHP-laitteiden esittely
- Projektiryhmän tapaaminen
- Kaasutuksen testauksen tulokset
- H-CHP-yksiköiden tulokset
- H-CHP:n käyttö
- Mahdollisuus antaa ehdotuksia työkalupaketin kehittämiseen.
- Mahdollisuus antaa ehdotuksia oppaiden kehittämiseen.
- Avoimen lähdekoodin käyttö H-CHP-suunnitteluun

Työpajat ovat välttämättömiä seuraaville:

- Energiayhtiöt
- Viranomaiset
- Kunnat
- CHP-yritykset / valmistajat
- Biomassan polttoaineen toimittajat
- Tutkijat
- Arkkitehdit
- Insinöörit
- Energiatehokkuuden asiantuntijat
- Energiatehokkuuden asiantuntijat

Työpajojen aikana on mahdollisuus tehdä kysymyksiä H-CHP-tiimin insinööreille joko henkilökohtaisesti tai tallenteena. Laitteet ovat esillä fyysisesti tai virtuaalisesti. Projektissa kehitetään työkalupakettia ja soveltamisopasta yhteisöille. Työpajoissa on mahdollisuus tehdä ehdotuksia työkalupaketin ja oppaan sisältöihin jotta ne palvelisivat parhaalla mahdollisella tavalla niiden käyttäjiä.

About the Project

The purpose of the project is to promote the uptake of household (micro) combined heating and power systems (H-CHP) using solid renewable biomass and gasification methods that will be appropriate for remote households.

The Northern Periphery Area has abundant natural fuel resources but is subject to a harsher climate than the rest of Europe and this results in the need for increased domestic energy. Attempts to exploit natural energy resources for households has been mixed.

Our project analyses the energy needs of remote households in the region. The available fuel is mainly solid which is unsuitable for existing gas CHP. We propose a new affordable solution that uses local renewable solid biofuel in a small-scale micro CHP system. The advantage of this approach is that all fuel used is carbon neutral, transport costs are minimal, and there are reduced CO2 emissions. This helps with carbon legislation compliance, reduced transmission losses from the grid, and the electricity-to-heat production ratio is a good match for our colder parts of Europe.

Tietoa hankkeesta

Hankkeen tavoitteena on edistää syrjäseutujen kotitalouksille sopivien kiinteää uusiutuvaa biomassaa käyttävien yhdistetyn lämmön- ja sähköntuotantojärjestelmien (H-CHP) käyttöönottoa.

Pohjoisella periferia-alueella on runsaasti energiavaroja. Ilmasto on karumpi kuin muualla Euroopassa jolloin energian tarve on suuri. Tavoitteena on hyödyntää saatavilla olevia energiavaroja monipuolisesti.

Projektimme analysoi alueen haja-asutetuilla seuduilla olevien kotitalouksien energiantarpeita. Käytettävissä oleva polttoaine on pääasiassa kiinteää, joka ei sovellu olemassa olevaan kaasulla toimivaan CHP-järjestelmään. Ehdotamme uutta edullista ratkaisua, jossa käytetään paikallista uusiutuvaa kiinteää biopolttoainetta pienimuotoisessa mikro-CHP-järjestelmässä. Tämän etuna on, että kaikki käytetyt polttoaineet ovat hiilineutraaleja, kuljetuskustannukset ovat vähäiset ja hiilidioksidipäästöt pienemmät. Tämä auttaa noudattamaan hiilidioksidilainsäädäntöä ja vähentämään sähkönsiirron aiheuttamaa hävikkiä sähköverkoissa. Lisäksi järjestelmän sähkön ja lämmön tuotannon suhde on sopiva Euroopan kylmemmille alueille.

Our project partners are / Hankekumppanimme ovat:

Oulun yliopisto - Suomi - (FI)
Oulun ammattikorkeakoulu Oy - Suomi (FI)
Tighean Innse Gall - Scotland (UK)
Lews Castle College - UHI - Scotland (UK)
Luleå tekniska universitet - Sverige (SE)
Energy Action - Ireland (IE)
Háskóli Íslands - Ísland (IS)

Associated Partners / Yhteistyökumppanit:

Point & Sandwick Trust (UK)
The Woodland Trust Scotland (UK)
Vuolux Oy (FI)

The project is funded by the Northern Periphery and Arctic Programme 2014-2020 of the European Union. Hanketta rahoittaa Euroopan unionin pohjoinen periferia ja taiteellinen ohjelma 2014-2020.



Biographies of Presenters

Torbjörn Ilar



Torbjörn is an associate professor at Luleå University of Technology, Sweden. He has more than 25 years of experiences in the development and performance of industrial driven research project at the division in the field of laser processing and modeling of manufacturing systems. This includes both technical research project and education project and has in many cases been multi-disciplinary, multi country and/or multi culture projects. The research during the last year has shifted more towards energy application including development of steam expander for waste steam application and the ongoing H-CHP project. The research also includes productivity assessments and manufacturing system development for construction industry.

Markku Kananen



Markku is a project manager in the University of Oulu, Finland. He has over twenty years' experience as a professional engineering designer within both the private and public sector. Projects include interdisciplinary projects e.g. instrumentation of space crafts and stiff-in-light industrial products. His current project aim is to promote the uptake of CHP systems using solid renewable biomass and gasification methods in a small scale.

Markku Korhonen



Markku Korhonen was born in Finland in 1956. He received the B.Sc. Eng. and M.Sc. Tech., degrees from Raahe Institute of Computer Engineering and University of Oulu, Finland, in 1981 and 1994, respectively.

He joined Datamic Ltd. later Ahlstrom Automation Ltd, Raahe, Finland, in 1981. Between 1994 and 2001, he worked for Rautaruukki Ltd. and Nokia Corp. Since 2001 he has been with the Oulu University of Applied Sciences, Oulu, where he is currently a Senior Lecturer having responsibility of R&D projects in Energy and Automation department. His main areas of research interest are renewable energy systems.

Biographies of Presenters

Dr. Alasdair MacLeod



Alasdair Macleod is a Senior Lecturer in Energy Engineering at Lews Castle College, Stornoway, part of the University of the Highlands and Islands, and has a PhD in Physics from the University of Strathclyde. He is the UHI BEng Energy Engineering programme leader and lectures on the following topics: Renewable Energy Generation, Conventional Energy Systems, Wind Energy, Mechanical Engineering Applications, Control and Instrumentation, and Future Energy. He supervises a number of PhDs on the topic of hydrogen and is involved in a number of European and national projects focused on renewable energy.

Brian Mcsharry



Brian was appointed CEO of Energy Action in January 2017. Before that he worked with the Department of Energy in Dublin in a number of roles including electricity, all-island energy market, finance and strategic management. He has a Bachelors degree in Political Science and a Masters in Policy Studies from Trinity College Dublin. His thesis examined energy efficiency in the Irish domestic sector. Brian served as a voluntary member of the Board of Directors of Energy Action from 1995-2007.

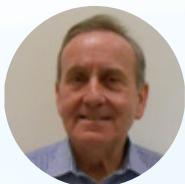
Giuseppe Petricca



Giuseppe Petricca, 32 years old, from Italy, has come to Lews Castle College, University of the Highlands and the Islands to complete his study cycle, culminating in an Honours Bachelor's degree last year, and preparing a Master in Research for the next. The projects in which he is involved range in the categories of Renewable Energies and Energy Distribution, with focus on the applications of Smart Grids in little and/or remote communities. Among them, the two biggest are a Model of the entire Western Isles Energy Grid and an extensive simulation process for the adaptation of H-CHP in small communities.

Biographies of Presenters

Charles Roarty



Charles is an Energy Consultant with Energy Action and was CEO and Company Secretary up to December 2016 managing Energy Action since 1990, and would have been the principal driver of fuel poverty policy in Ireland, and has helped to establish 24 Community Projects nationally to deliver a similar energy efficiency service in their local area. Previous to this, he would have 20 years experience working in the steel, motor, chemical and banking industry in Ireland and Scotland as an accountant. He is a graduate of Caledonian University, and also a graduate of Maynooth University in Community and Social studies.

Since 1991, Energy Action has been a partner in 27 European projects, 4 INTERREG projects and he has been involved in all and been the legal representative for most of them. Energy Action are currently involved in 4 European projects as partner or on the advisory Board.

He has been responsible for Energy Action publishing a number of reports including Homes for the 21st Century - The Costs & Benefits of Comfortable Housing for Ireland, also Energy Conservation & Job Creation in the Domestic Sector, and Mapping Fuel Poverty in the Republic.

Catherine Anne Smith



Catherine joined TIG in 1995 as a part-time Admin Officer and was promoted to full-time Office Manager in 2000. Her duties within TIG include HR management, assistant to the CEO and Management Committee, and Health & Safety Administrator, implementing policies and procedures to ensure health and safety compliance within the organisation. Catherine is responsible for operations of H-CHP within TIG.

Catherine is also a Board Member of Point & Sandwick Development Trust who provide funding and assistance to groups within the local community from the proceeds of their community windfarm. TIG also works closely with the Development Trust delivering their LED community project.

Rúnar Unnþórsson



Rúnar Unnþórsson is a professor of engineering at the University of Iceland and the Dean of the Faculty of Industrial Engineering, Mechanical Engineering and Computer Science. His research is in the field of design, development and improvement of integrated systems. Rúnar is currently working on development of a methodology and hardware for gasification of organic waste and the production of heat and electricity. The solution is integrated heat and electricity generation and fuel organic waste.

Biographies of Presenters

Stewart Wilson



Stewart Wilson is CEO of Tighean Innse Gall (TIG), a not for profit organisation run primarily for the benefit of the Outer Hebrides' community at large.

Stewart's background is specialist Architectural Building Science consultancy assessing building performance particularly in the domestic and commercial sectors across the UK, Europe, Canada and the USA. He is a certified member of the Association for Project Safety with over 25 years' experience in construction, energy efficiency, housing development, building performance, health & safety and fuel poverty issues.

Brian Whittington



Brian is the corporate strategy and projects coordinator for Tighean Innse Gall (TIG), a not for profit organisation run primarily for the benefit of the Outer Hebrides' community at large.

Brian has 20 years of experience of developing and working on community-based energy across all four of the countries of the UK and within European projects. He is unique in the UK for being a teacher in adult education with a specialism (PGCE) on energy efficiency in a community context. He holds a masters in public administration from the University of London.

Sanna Salomaa



Sanna has been working as a project manager for the University of Oulu since April 2018. She manages some the administrative and financial tasks for the Future Manufacturing Technologies research group, as well as the communicational and organizing responsibilities. Sanna also organizes the FMT research group's public seminars. She received her M.A. degree in Cultural Anthropology from the University of Oulu in January 2018.



**Northern Periphery and
Arctic Programme**
2014–2020



EUROPEAN UNION

Investing in your future
European Regional Development Fund

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University of Oulu - Kerttu Saalasti Institute, Finland

Future Manufacturing Technologies - FMT