susmilk

# RE-DESIGN OF THE DAIRY INDUSTRY FOR SUSTAINABLE MILK PROCESSING

The research leading to these results has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration within the SUSMILK project, grant agreement n° 613589

# Re-design of the dairy industry for sustainable milk processing

| | |
|---|---|
| Grant agreement no.: | 613589 |
| Call | FP7-KBBE.2013.2.5-02 |
| Instrument: | Collaborative project |
| Start date of Project: | 01/11/2013 |
| Duration: | 36 months |

| **Project funded by the European Commission within the Seventh Framework Programme** | | |
|---|---|---|
| **Dissemination Level** | | |
| **PU** | Public | **x** |
| **PP** | Restricted to other programme participants (including the Commission Services) | |
| **RE** | Restricted to a group specified by the consortium (including the Commission Services) | |
| **CO** | Confidential, only for members of the consortium (including the Commission Services) | |

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration

## Content

## 4.1 Final publishable summary report: attached documents

In the following all materials promoting the work of SUSMILK is reported as well as a list of all beneficiaries including the respective contact names, when allowed.

### 4.1.1 SUSMILK project logo and title

**"Re-design of the dairy industry for sustainable milk processing"**

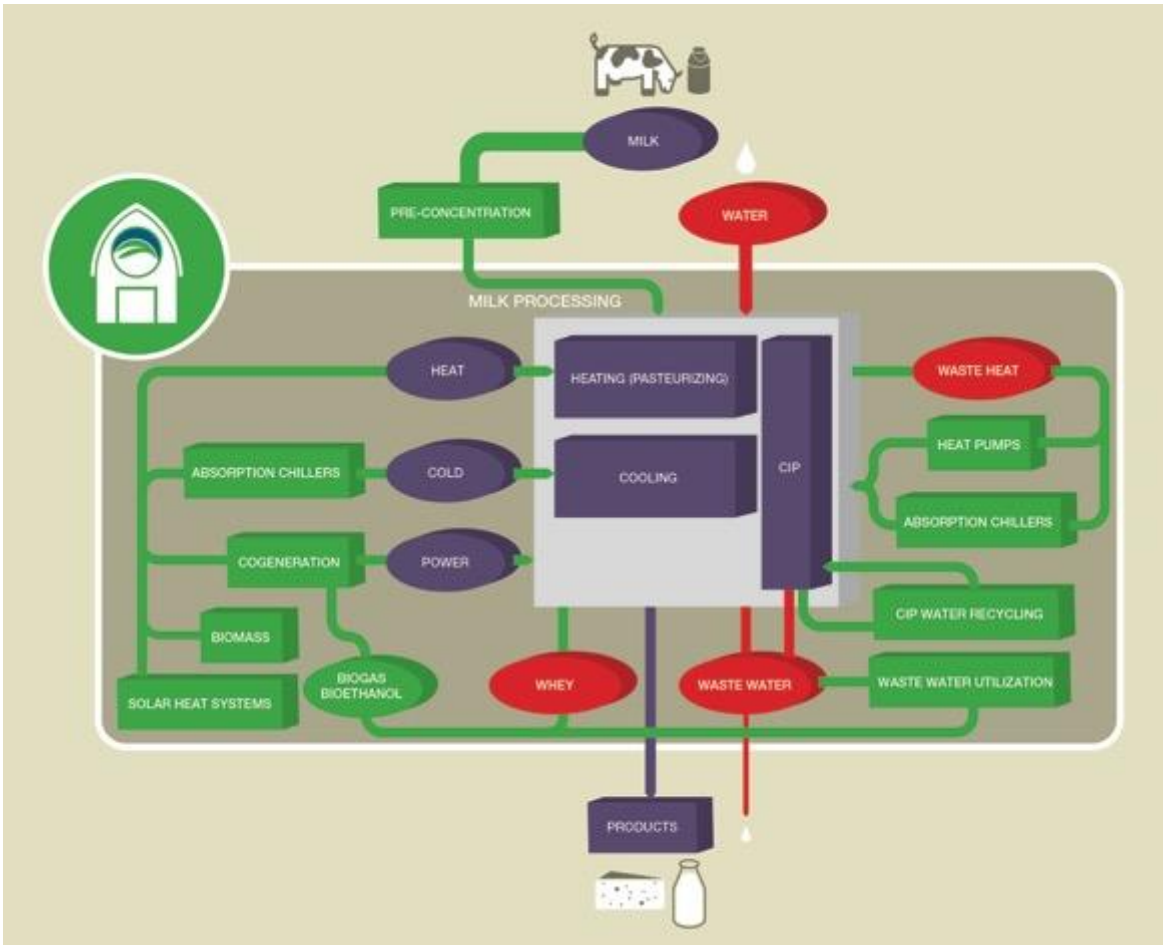

**www.susmilk.com**

### 4.1.2 Greendairy.net logo and title

**"Towards a resource efficient dairy sector"**

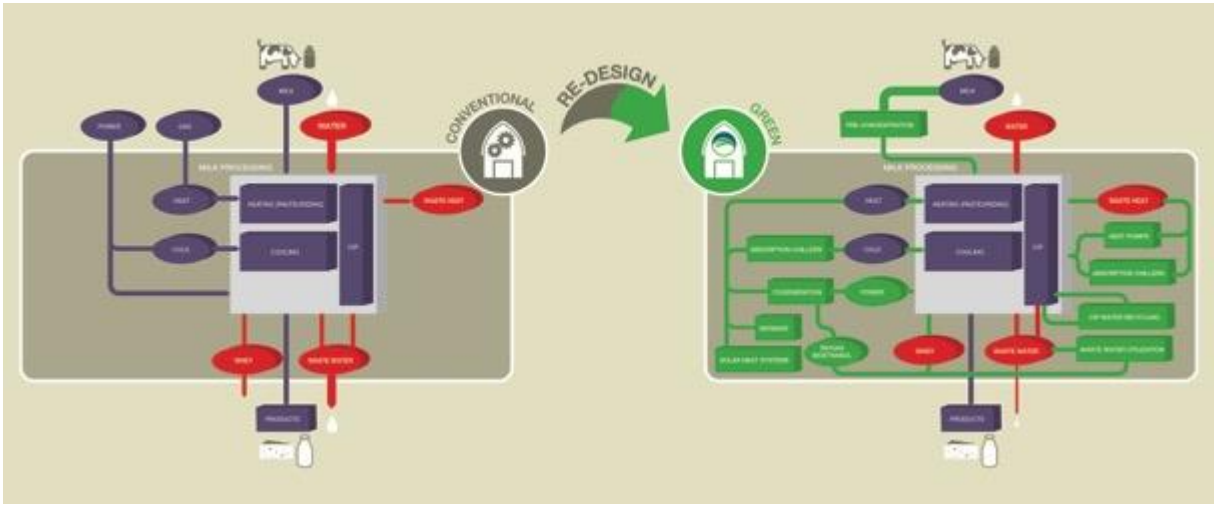
**www.greendairy.net**

### 4.1.3 SUSMILK dairy model




SUSMILK “green dairy” model © t2i scarl

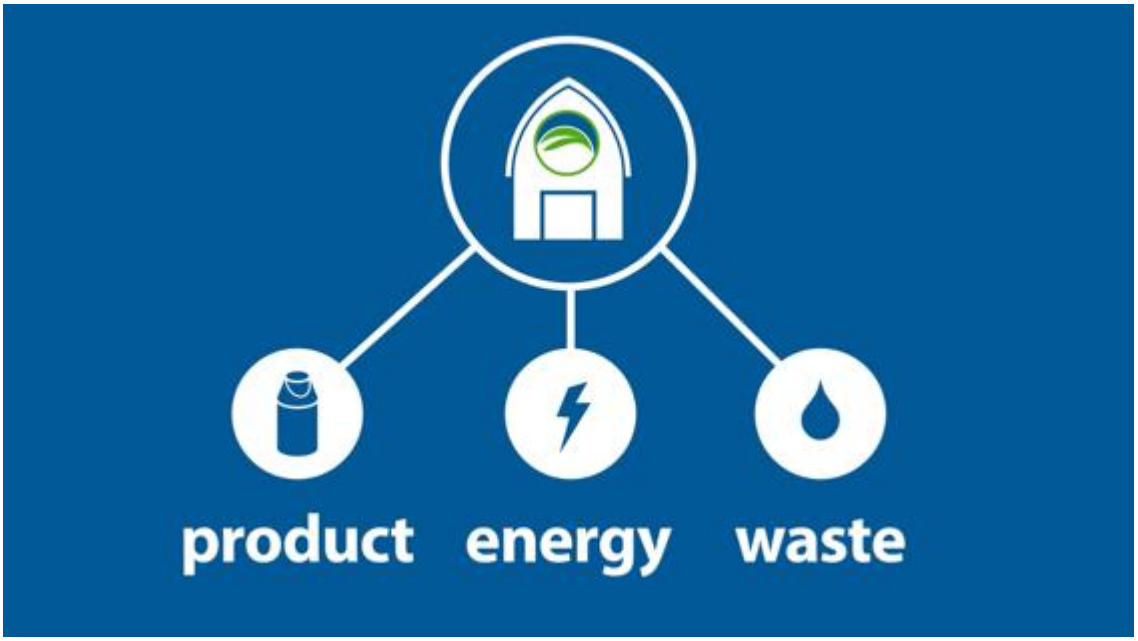
SUSMILK concept to re-design conventional dairy © t2i scarl



### 4.1.4 Video

Promotional video link: **https://www.youtube.com/watch?v=v14EZX1MMw8** © t2i scarl

See also public Deliverable 9.7: "Video produced" (**http://www.susmilk.com/index.php/en-project/en-deliverables**) and also link to the SUSMILK website: http://www.susmilk.com/index.php/en-resourcen/en-videos




### 4.1.5 Selected pictures

Coordinator (Fraunhofer UMSICHT), hosting partner (FEUGA) and keynote speakers at SUSMILK final conference © t2i scarl

SUSMILK partners during the 12 month meeting at FINS in Novi Sad, Serbia © t2i scarl


## 4.1.6 Text: project summary of objectives and results

**The "green dairy" model of the SUSMILK project:**

**optimizing energy and water consumption in milk processing**

### Introduction

The main idea of the collaborative project SUSMILK "Re-design of the dairy industry for sustainable milk processing" is to analyze and optimize the whole process chain for milk and milk products with regard to energy and water consumption.

### Objectives

1. Application of new technologies for heat generation and distribution in dairies
2. Adaption of new chilling technologies
3. Application of membrane filtration techniques for an innovative pre-concentration of milk
4. Classifying of waste-stream treatments for water savings and/or energy production
5. Testing of all technologies and concepts in pilot applications under real life conditions

6. LCA of the dairy operation with a special foccus on energy and water uses and development of a decision making tool for more competitive and "green dairy" plants

7. Exergy analysis to show the full potential within the dairy industry

**Innovation fields in SUSMILK**

Product processing:
- Pre-concentration of raw milk
- Low temperature drying of milk

Energy technology:
- Solar heat system
- Heat pump
- Absorption chiller

Waste processing:
- Waste water processing and recycling
- Microparticulation and lactic acid production
- Bioethanol and biogas production

**Results**

1. Demonstrated milk concentration unit (30 % dry substance or higher)

2. Demonstrated energy technologies: ROI <2Y (heat pump, absorption chiller), 6Y for solar heat + biomass boiling system

3. Individual recommendations for waste(water) treatment and recovery of bioenergy published

4. A "green dairy" simulation tool which will help to design new and to adapt existing facilities: susmilk.com/SOT

5. POTENTIAL SAVINGS: Green Dairy (exergy) in relation to SUSMILK generic dairy: 60 % in resources (exergy), 67 % reduction in environmental impact (LCA Indicator) and 61 % energy costs

6. SUSMILK green dairy scenarios allow to check individual results Overall recommendations are published in susmilk.com

**Conclusions**

SUSMILK has developed new concepts and technologies for the supply of heat, cold and power and integrated them into a "green dairy" concept that aims at maximizing water and energy savings.

Depending on the current state significant savings in terms of water and energy can be realized. An analysis of your dairy can be made on request.

**Get Involved**

Are you willing to test unattainable cost-cutting strategies? Profit from being informed about SUSMILK front-end technological innovations for dairies!
**www.susmilk.com**

Get updates about resource efficient solutions in milk processing and contribute with your expertise to a future oriented green dairy concept registering at
**www.greendairy.net**

**Project Factsheet**

Grant Agreement 613589 | Call FP7-KBBE.2013.2.5-02
Instrument: Collaborative Project | Budget: €7.64 M
Start date: Nov 1, 2013 | Duration: 36 months

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 613589

## 4.1.7 Brochure

In SUSMILK a brochure to promote the general idea and concept has been developed. The brochure is displayed on the following page, but is also accessible here:
http://www.susmilk.com/index.php/en-resourcen/en-press-material

# TOWARDS AN INNOVATION-DRIVEN AND COMPETITIVE FOOD PRODUCTION

RTD

Fraunhofer UMSICHT

LNEG

NTNU – Trondheim Norwegian University of Science and Technology

ktu kaunas university of technology 1922

FINS University of Novi Sad INSTITUTE OF FOOD TECHNOLOGY

UNIVERSITÀ DEGLI STUDI DI PARMA

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

Industry

SIMAKA Energie- und Umwelttechnik GmbH

SOLARFOCUS makes you independent

ACRAM

Parker

Dairy

QUEIZUAR

FEIRACO

Exquisa

imlek

Wiegert Milch

LCA & Diss.

RICHTVERT. Energy Systems Consultancy

ESU-services fair consulting in sustainability

FOOD-PROCESSING INITIATIVE

FEUGA FUNDACIÓN EMPRESA - UNIVERSIDAD GALLEGA

t2i trasferimento tecnologico e innovazione


**Project Factsheet**

Grant Agreement 613589 | Call FP7-KBBE.2013.2.5-02
Instrument: Collaborative Project | Budget: €7.64 M
Start date: Nov 1, 2013 | Duration: 36 months



**Dissemination Management**

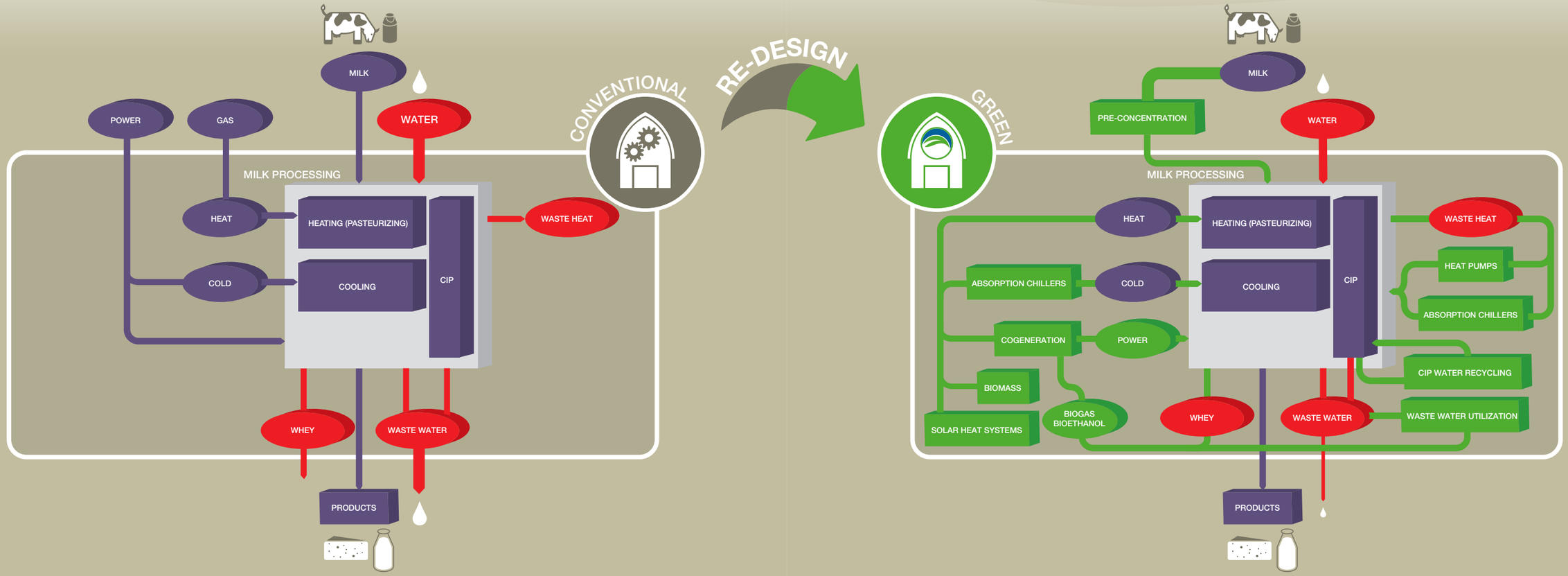
Norbert Reichl norbert.reichl@foodprocessing.de
Ana Muñiz Alonso amuniz@feuga.es
Marco Battistella marco.battistella@t2i.it


susmilk

# DELIVER HIGH QUALITY DAIRY PRODUCTS IN THE BEST SUSTAINABLE WAY!


This project has received funding
from the European Union's Seventh Framework Programme
for research, technological development and demonstration

# susmilk Re-design of the dairy industry for sustainable milk processing




## Overview:

The main idea of the project is to analyze and optimize the whole process chain for milk and milk products with regard to energy and water consumption. SUSMILK aims at developing new concepts and technologies for the supply of heat, cold and power and integrating them into the respective process steps. A central part of the project is the integration of innovative and efficient technologies into a "green dairy" concept that will aim at maximizing water and energy savings.

## Objectives and outcomes:

- development and evaluation of innovative technologies to reduce the water and energy demand in the dairy
- pilot plant test runs under real life conditions in 5 European dairies
- LCA and development of a decision making tool for more competitive and "green dairy" plants
- exergy-based analysis to show the full potential of energy and water savings within the dairy industry

## The "green dairy" model of the SUSMILK project: a technology and innovation-driven approach for a sustainable industry

**Find more details about technology applications in our information sheets! susmilk.com > resources > press material**


**Coordinator Contacts**

Prof. Dr. Görge Deerberg (project coordinator)
Dr. Christoph Glasner (project manager)
christoph.glasner@umsicht.fraunhofer.de

**Coordinator Address**

Fraunhofer Institute for Environmental,
Safety, and Energy Technology UMSICHT
Osterfelder Str. 3, 46047 Oberhausen, DE


Are you willing to test unattainable cost-cutting strategies?
Profit from being informed about SUSMILK
front-end technological innovations for dairies!

**www.susmilk.com**

Get updates about resource efficient solutions
in milk processing and contribute with your expertise
to a future oriented green dairy concept registering at

**www.greendairy.net**

### 4.1.8 Technical Flyer

In SUSMILK 6 technical flyers have been developed. The flyer provide initial information of the SUSMILK heat pump, absorption chiller, solar heat system, milk concentration, wastewater treatment and the GreenDairyNet. The flyers are displayed on the following pages, but are also accessible here: http://www.susmilk.com/index.php/en-resourcen/en-press-material

susmilk

# INDUSTRIAL APPLICATIONS
# HEAT PUMPS

## Field of application

Until a milk product can be stored in the fridge, energy intensive heating and cooling process steps are necessary. By recovering the waste heat of the process steps within a dairy and utilizing it on a useful temperature level, a large amount of energy and thus money can be saved.

## Technology concept

An innovative high temperature heat pump allows leading thermal energy in a circuit. The system is equipped with a special working fluid and can either be driven by an electric motor or a gas engine. It allows an output temperature of approx. 120 °C whereas the input temperature of the heat sources can go up to 80 °C.

## Contribution to sustainable milk processing

- waste heat reutilization steam substitution
- well water substitution
- partially substitution
- pump as main heat source
- operational costs, max 3Y ROI

Fraunhofer UMSICHT

SIMAKA Energie- und Umwelttechnik GmbH

Exquisa

Dr. Christoph Glasner +49 208 8598 1133
christoph.glasner@umsicht.fraunhofer.de

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT

**www.susmilk.com**

Re-design of the dairy industry for sustainable milk processing

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration

susmilk

# INDUSTRIAL APPLICATIONS
# ABSORPTION CHILLERS

## Field of application

A major part of consumption of external energy (by burning fuels or as electric power) and the $CO_2$ footprint of a dairy facility will be reduced with an absorption chiller by using waste heat or renewable energy sources (solar heat). This technology can be applied to a large variety of industries.

## Technology concept

A 50 kW absorption chiller will be developed. This medium range is currently not available on the market and allows meeting the demands of different sizes of dairies. A single chiller or a cascade of them can be used to generate cold from waste heat to reduce energy costs by saving energy to produce cold traditionally by electrical energy.

## Contribution to sustainable milk processing

- waste heat reutilization
- best with cogeneration
- chiller as cooling source
- fossil fuels replacement

Fraunhofer UMSICHT

Parker


FEIRACO

Dr. Christoph Glasner +49 208 8598 1133
christoph.glasner@umsicht.fraunhofer.de

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT

**www.susmilk.com**

Re-design of the dairy industry for sustainable milk processing

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration

susmilk

# INDUSTRIAL APPLICATIONS
# SOLAR HEAT SYSTEMS

## Field of application

The combined solar and biomass heat systems will be implemented at Queizuar-Bama (ES), which processes 50.000 litres per day, producing 3 types of cheese. SOLARFOCUS (AT) will replace a part of the already existing fossil fuel heat system by a cost-saving biomass and solar energy system.

## Technology concept

A solar thermal collector field of about 50 m² will provide heat for the cleaning tunnels and the hall heating. If there is no sunshine a pellet-boiler of about 70 kW will provide the necessary heat. The use of actual weather data will increase the solar fraction and enable higher savings. The system can be remotely controlled by PC, smartphone or tablet.

## Contribution to sustainable milk processing

solar energy for cleaning tunnels

machine adaption

fossil fuels replacement

Fraunhofer UMSICHT

SOLARFOCUS makes you independent

QUEIZUAR

Dr. Christoph Glasner +49 208 8598 1133
christoph.glasner@umsicht.fraunhofer.de

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT

**www.susmilk.com**

Re-design of the dairy industry for sustainable milk processing

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration

susmilk

# INDUSTRIAL APPLICATIONS
# PRE-CONCENTRATION

**Field of application**

Milk has to be transported under controlled temperature from its production until its first processing in a dairy. Shifting the concentration step upstream to the farm or milk collection point can reduce transport energy.

**Technology concept**

The pre-concentration will be realized through an innovative membrane process that can be carried out at low temperatures, in contrast to evaporation. Ultrafiltration, reverse osmosis and microfiltration will be considered to develop a single or multi-stage process for milk concentration.

**Contribution to sustainable milk processing**

- cooling and transportation
- permeate streams reutilization
- complementary to vapour
- evaporation temperature
- transportation costs

Fraunhofer UMSICHT

ACRAM

Wiegert Milch

Dr. Christoph Glasner +49 208 8598 1133
christoph.glasner@umsicht.fraunhofer.de

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT

**www.susmilk.com**

Re-design of the dairy industry for sustainable milk processing

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration

susmilk

# INDUSTRIAL APPLICATIONS
# WASTE WATER TREATMENT

## Field of application

The reuse of CIP (clean-in-place) solutions has to be enhanced to reduce costs and to act more sustainable. In addition dairy wastewaters will be classified aiming at optimal yield of bioethanol/lactic acid/biogas production in an environmental friendly industrial production.

## Technology concept

The basic idea is to combine an innovative and optimized system involving pre-treatment, anaerobic digestion and membrane processes, capable to provide clean water and a low sludge volume to dispose. Bioethanol production can be an additional output if the viability of this process can be demonstrated.


## Contribution to sustainable milk processing

biogas production

organic residue utilization

operational costs

*Lab scale experiments at:*

LNEG

ktu kaunas university of technology 1922

NTNU – Trondheim Norwegian University of Science and Technology

FINS University of Novi Sad INSTITUTE OF FOOD TECHNOLOGY

MLEKARA SUBOTICA

Dr. Christoph Glasner +49 208 8598 1133
christoph.glasner@umsicht.fraunhofer.de

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT

**www.susmilk.com**

Re-design of the dairy industry for sustainable milk processing

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration

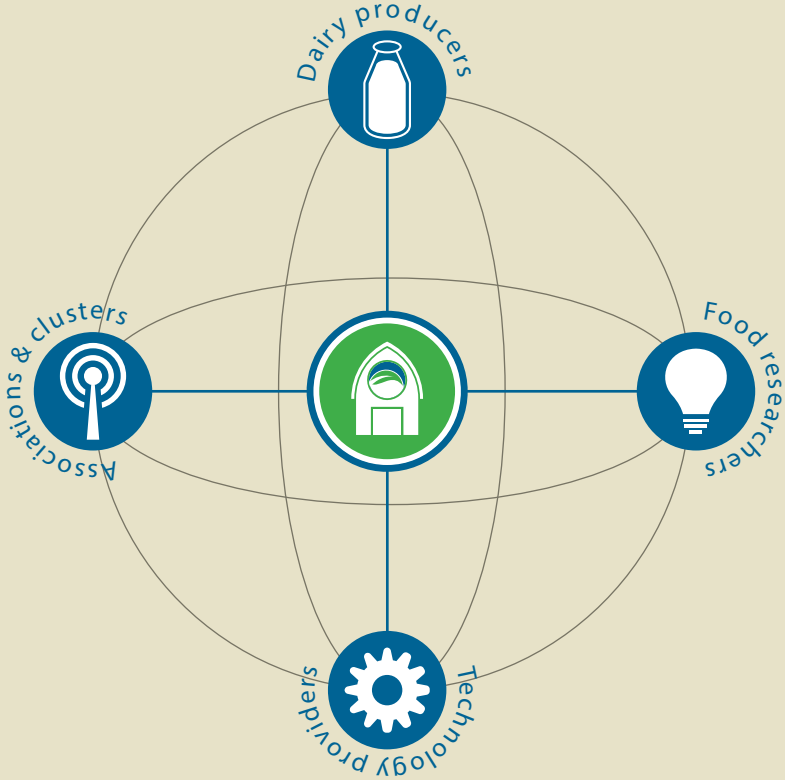
susmilk

# OPEN INNOVATION TOOL
# www.GreenDairy.Net

**What is GreenDairyNet?**
GDN is a private contact, meeting and knowledge sharing platform for experts and stakeholders of the European dairy sector, whose common interests are sustainable development and resource efficient processing technologies.

**Main goals**
Facilitate transnational relations to establish new collaborations and promote innovation dynamics in the dairy sector. Showcase initiatives, technologies and expertises related to energy efficiency in the dairy sector with a "open innovation" approach.


Contribute with your expertise to a future oriented green dairy concept!
Register now! www.greendairy.net




## Profile

Describe your expertise specifying skills, interests and professional network.

Contact dairy experts, share publications and ideas!

## Knowledge

Scientific and technological developments, business experiences and trends.

Get access to relevant information for a green dairy!

## Communities

Meeting points visible and accessible only to community members.

Participate in professional communities of interest!

GDN platform administrators

Norbert Reichl norbert.reichl@foodprocessing.de
Ana Muñiz Alonso amuniz@feuga.es
Marco Battistella marco.battistella@t2i.it

**www.susmilk.com**
Re-design of the dairy industry for sustainable milk processing

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration

### 4.1.9 Poster

In SUSMILK a general layout for posters was developed in order to present the findings on conferences in a harmonized way. An example is shown on the next page.

De Doelen Rotterdam, 16 - 21 October
**SUSMILK @IDFWDS2016 #GreenDairy**

# The “green dairy” model of the SUSMILK project: optimizing energy and water consumption in milk processing

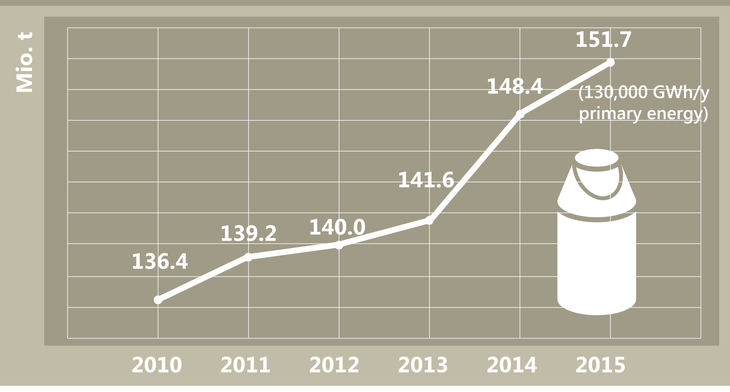
Christoph GLASNER[1], Marco BATTISTELLA[2]

Keywords: technology development, re-design, implementation of efficient technologies, concentration of milk, utilization of wastes, recycling, green dairy, process simulation.

## Introduction

The main idea of the collaborative project „Re-design of the dairy industry for sustainable milk processing“ (SUSMILK) is to analyze and optimize the whole process chain for milk and milk products with regard to energy and water consumption.

**Raw cow milk processed per year in the EU-28**

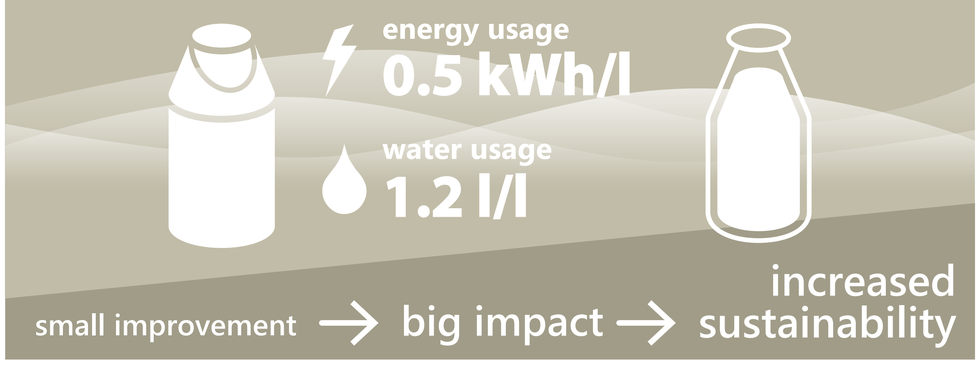



Source: Eurostat

## Objectives

1. Application of new technologies for heat generation and distribution in dairies
2. Adaption of new chilling technologies
3. Application of membrane filtration techniques for an innovative pre-concentration of milk
4. Classifying of waste-stream treatments for water savings and/or energy production
5. Testing of all technologies and concepts in pilot applications under real life conditions
6. LCA of the dairy operation with a special focus on energy and water uses and development of a decision making tool for more competitive and "green dairy” plants
7. Exergy analysis to show the full potential within the dairy industry

**Producing market milk from 1 liter of raw milk requires:**




**Innovation fields in SUSMILK**

### product processing
- Pre-concentration of raw milk
- Low temperature drying of milk

### energy technology
- Solar heat system
- Heat pump
- Absorption chiller

### waste processing
- Waste water processing and recycling
- Microparticulation and lactic acid production
- Bioethanol and biogas production

## Results

1. Demonstrated milk concentration unit (30 % DS or higher)
2. Demonstrated energy technologies: ROI <2Y (heat pump, absorption chiller), 6Y for solar heat + biomass boiling system
3. Individual recommendations for waste(water) treatment and recovery of bioenergy published
4. A “green dairy” simulation tool which will help to design new and to adapt existing facilities: **susmilk.com/SOT**
5. POTENTIAL SAVINGS: Green Dairy (exergy) in relation to SUSMILK generic dairy: 60 % in resources (exergy), 67 % reduction in environmental impact (LCA Indicator) and 61 % energy costs
6. SUSMILK green dairy scenarios allow to check individual results, overall recommendations are published in susmilk.com

## Conclusions

SUSMILK has developed new concepts and technologies for the supply of heat, cold and power and integrated them into a “green dairy” concept that aims at maximizing water and energy savings.

Depending on the current state significant savings in terms of water and energy can be realized. An analysis of your dairy can be made on request.

## Get Involved

Are you willing to test unattainable cost-cutting strategies? Profit from being informed about SUSMILK front-end technological innovations for dairies!

**www.susmilk.com**

Get updates about resource efficient solutions in milk processing and contribute with your expertise to a future oriented green dairy concept registering at

**www.greendairy.net**

## Project Factsheet

Grant Agreement 613589 | Call FP7-KBBE.2013.2.5-02
Instrument: Collaborative Project | Budget: €7.64 M
Start date: Nov 1, 2013 | Duration: 36 months

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 613589

1 **Fraunhofer UMSICHT**

The Fraunhofer-Gesellschaft is the leading organization for applied research in EU. Fraunhofer maintains 67 research institutes. The Fraunhofer-Institute for Environmental, Safety, and Energy Technology UMSICHT develops applied and custom-made process engineering technologies for industrial enterprises, service companies and public authorities.

FHG role: project coordination, development, test, demonstration of membrane technology processes (CIP recycling, milk concentration) and drying of milk concentrate. Green dairy concept design and simulation.

**Dr. Christoph Glasner**
Project manager, Dep. Process Engineering
christoph.glasner@umsicht.fraunhofer.de

2 **t²i - technology transfer and innovation**

T2I is a no-profit agency that aims at promoting an innovation oriented business culture operating in three main areas: (1) Innovation, technology transfer, R&D and project management; (2) Vocational and management training and start-ups support; (3) Integrated services for agro-food quality, instrument metrology, safety, environment & energy, product testing, IP.

T2I role: definition of a dissemination strategy and plan for the dissemination of results, management of the exploitation of IP findings to maximize the project impact.

**Marco Battistella, MSc**
I&TT Project Manager
marco.battistella@t2i.it

### 4.1.10 Beneficiaries list

In the following the SUSMILK beneficiaries are listed together with the respective contact persons.

| Partner: | Contact details: |
|---|---|
| Fraunhofer UMSICHT | **FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGE-WANDTEN FORSCHUNG E.V.**<br><br>*for its entity*<br><br>Fraunhofer-Institute for Environmental, Safety, and Energy Technology UMSICHT<br>Osterfelder Straße 3<br>46047 Oberhausen, Germany<br>http://www.umsicht.fraunhofer.de<br><br>**Dr.-Ing. Christoph Glasner**<br>Project manager, Department Process Technology, Business Unit: Bio-mass and Residues Utilization<br>Phone: +49 208 8598-1133<br>Fax: +49 208 8598-1295<br>mailto:christoph.glasner@umsicht.fraunhofer.de<br><br>de.linkedin.com/pub/christoph-glasner<br>researchgate.net/profile/Christoph_Glasner |
| LNEG | **Laboratório Nacional de Energia e Geologia**<br>Estr. Paço do Lumiar, 22<br>1649-038 Lisbon, Portugal<br><br>**Dr.-Ing. Pedro Azevedo**<br>Solar Energy Unit<br>Phone: +351 210924780<br>mailto: pedro.azevedo@lneg.pt |
| NTNU Norwegian University of Science and Technology | **Norwegian University of Science and Technology**<br>Sem Saalands vei 6/8<br>7491 Trondheim, Norway<br><br>**Prof. Alexander Dikiy**<br>Department of Biotechnology<br>Tel: +47-73597863 |

| Partner: | Contact details: |
|---|---|
| | Fax:+47-73591283<br>Mailto: alex.dikiy@biotech.ntnu.no |
| ktu kaunas university of technology 1922 | **KAUNO TECHNOLOGIJOS UNIVERSITETAS**<br>K. Donelaičio str. 73<br>LT- 44249, Kaunas, Lithuania<br>www.ktu.edu<br><br>**Prof. Habil. dr. Gražina Juodeikienė**<br>Head of a research team of the KTU Department of Food Science and Technology<br>Radvilenu road. 19,<br>LT- 50254, Kaunas, Lithuania<br><br>Phone.: +370 37 300 188, +370 37 300 421<br>Fax: +370 37 300 152<br>mailto: grazina.juodeikiene@ktu.lt |
| University of Novi Sad INSTITUTE OF FOOD TECHNOLOGY FINS | **INSTITUTE FOR FOOD TECHNOLOGY**<br>Bulevar cara Lazara 1<br>21000 Novi Sad, Serbia<br><br>**Dr. Nebojsa Ilic**<br>Contact person<br>Phone: +381 21485 3824<br>Fax: +381 21 450725<br>Mail: nebojsa.ilic@fins.uns.ac.rs<br><br>https://www.linkedin.com/in/nebilic?trk=nav_responsive_tab_profile |
| UNIVERSITÀ DEGLI STUDI DI PARMA | **Università degli Studi di Parma**<br><br>*for its entity*<br><br>Dipartimento di Scienze Medico-Veterinarie<br>Department of Veterinary Science<br>Strada del Taglio 10<br>43126 Parma, Italy<br>http://www.dipveterinaria.unipr.it/it |

| Partner: | Contact details: |
|---|---|
| | **Prof. Andrea Summer PhD**<br>Professor, Department of Veterinary Science<br>Phone: +39 521 032613<br>Fax: +39 521 032611<br>mailto: andrea.summer@unipr.it<br><br>http://www.unipr.it/ugov/person/19548<br>orcid.org/0000-0002-4833-657X<br>researchgate.net/profile/Andrea_Summer |
| | **University of Santiago de Compostela**<br><br>*for its entity*<br><br>**Aula de Productos Lácteos y Tecnología Alimentarias.**<br>Rua Montirón; 152; Lugo; PC:27002 (SPAIN)<br>http://www.aplta.es<br>http://www.usc.es<br><br>**Alfonso Pérez Quintáns**<br>Project manager, Head of R&D<br>Phone: +34 982 821 407<br>Mobile: +34 600 942 347<br>mailto: alfonso.perez@aplta.es |
| | **SIMAKA Energie- und Umwelttechnik GmbH**<br>Gewerbegebiet Göttlishofen<br>Buchwies 14<br>88260 Argenbühl, Germany<br>www.simaka.de<br><br>**Karsten Uitz**<br>Dipl.-Ing. Process Engineering (FH)<br>Managing Director<br>Phone: +49 (0) 7566/940 99-28<br>Fax: +49 (0) 7566/940 99-29<br>Mobil: +49 (0) 170/3367900<br>mailto: k.uitz@simaka.de |

| Partner: | Contact details: |
|---|---|
| SOLARFOCUS makes you independent | **SOLARFOCUS GmbH**<br>Werkstraße 1<br>4451 St. Ulrich/Steyr, Austria<br>www.solarfocus.com<br><br>**DI Joachim Kalkgruber**<br>Project manager, Head of R&D<br>Phone: +43 7252 50002 – 640<br>Fax: +43 7252 50002 – 9640<br>mailto:jo.kalkgruber@solarfocus.at |
| ACRAM | **ACRAM S.r.l.**<br>Loc. Pigna 13<br>I-37015 Sant'Ambrogio di Valp. (VR)<br>www.acram.it<br><br>**Dr. Maria Rosa Chesini**<br>Phone: +39 045 6835414<br>Fax: + 39 045 6835422<br>mailto:mariarosa.chesini@acram.it |
| Parker | **Parker Hannifin Manufacturing srl**<br>Hiross Zander Division<br>Strada Zona Industriale 4<br>35020 S.Angelo Di Piove , Italy<br>www.parker.com/hzd<br><br>**Chiara Favero**<br>Location Innovation Manager<br>Phone: +39 049 9712 146<br>mailto: chiara.favero@parker.com |
| Queixo Artesán QUEIZUAR, S.L. | **Queizuar SL**<br>A Silva - Bama, S/N 15822,<br>Touro, A Coruña, Spain<br>http://www.queixeriasbama.gal |

| Partner: | Contact details: |
|---|---|
| | **Dr. Ángel Pereira Rodríguez**<br>R&D&I Director<br>Phone: +34 981 504111<br>Fax: +34 981517379<br>mailto: angelpr@qbama.es<br><br>https://www.linkedin.com/in/angelpereirarodriguez?trk=nav_responsive_tab_profile |
| | **FEIRACO SOCIEDAD COOPERATIVA GALLEGA SL**<br>Pontemaceira – Agrón s/n<br>15864 Ames<br>A Coruña, Spain<br><br>**Ismael Martínez Lede**<br>Project manager, Department R&D<br>mailto:ismael.martinez@feiraco.es<br><br>https://www.linkedin.com/in/ismael-martínez-lede-9436b634?trk=nav_responsive_tab_profile_pic |
| | **Karwendel - Werke Huber GmbH & Co. KG**<br>Karwendelstraße 6 - 16<br>86807 Buchloe, Germany<br>www.exquisa.de<br><br>**Josef Scheuermeyer**<br>Operations manager<br>Phone: +49 8241 502 209<br>Fax.: +49 8241 502 12 209<br>mailto: josef.scheuermeyer@exquisa.com |
| | **AD IMLEK**<br>Industrijsko naselje bb<br>11213 Padinska Skela, Serbia<br><br>**Dr. Nurgin Memisi**<br>Quality Control Manager<br>Phone: + 381 24 626 123<br><br>nurgin.memisi@imlek.rs |

| Partner: | Contact details: |
|---|---|
| Wiegert Milch | **Molkerei Wiegert GmbH & Co. KG**<br>Am Bahnhof 18<br>46342 Velen, Germany<br>http://www.wiegertmilch.de/<br><br>**Bolko Meetz**<br>Phone: +492863/9240-118<br>Fax: +492863/9240-160<br>mailto: bolko.meetz@wiegertmilch.de |
| RICHTVERT. Energy Systems Consultancy | **Richtvert \| Energy Systems Consultancy**<br>**Dr. Andrej Jentsch**<br>Mindener Str. 6<br>48145 Muenster, Germany<br>http://www.richtvert.com<br><br>**Dr.-Ing. Andrej Jentsch**<br>Managing Director / Owner<br>Phone: +49 251 1491-260<br>mailto:andrej.jentsch@richtvert.de<br><br>www.linkedin.com/in/andrej-jentsch-0293872<br>www.researchgate.net/profile/Andrej_Jentsch |
| ESU services fair consulting in sustainability | **ESU-services Ltd. - fair consulting in sustainability**<br>Vorstadt 14<br>CH-8200 Schaffhausen<br>www.esu-services.ch<br><br>Project leader SUSMILK<br>http://esu-services.ch/projects/lcafood/susmilk/<br>**Dr. sc. Techn. Niels Jungbluth**<br>CEO - Chief Executive Officer<br><br>tel +41 44 940 61 32<br>e-mail: jungbluth@esu-services.ch<br>skype: niels.jungbluth<br>http://esu-services.ch/address/niels/ |

| Partner: | Contact details: |
|---|---|
| FOOD-PROCESSING INITIATIVE | **Food-Processing Initiative e.V.**<br>Ritterstr. 19<br>33602 Bielefeld<br>www.foodprocessing.de<br><br>**Norbert Reichl**<br>CEO<br>Phone: +49(0)521 98640-0<br>Fax: +49(0)521 98640-29<br>E-Mail: Norbert.Reichl@foodprocessing.de<br><br>https://www.linkedin.com/profile/preview?locale=en_US&trk=prof-0-sb-preview-primary-button<br><br>https://www.xing.com/profile/Norbert_Reichl/cv |
| FEUGA FUNDACIÓN EMPRESA - UNIVERSIDAD GALLEGA | **FUNDACIÓN EMPRESA-UNIVERSIDAD GALLEGA (FEUGA)**<br>Avenida Lope Gómez de Marzoa, s/n<br>Campus Universitario Sur<br>15705 Santiago de Compostela (Spain)<br>www.feuga.es/en<br><br>**Ana Muñiz Alonso**<br>Head of innovation projects department<br>Phone: +34 981 53 41 80. Ext.: 107<br>mailto:amuniz@feuga.es<br><br>https://es.linkedin.com/in/ana-muñiz-alonso-1520512a<br><br>**Almudena Justo Martínez**<br>EU Programmes-Head of Unit at FEUGA<br>Phone: +34 986 469 110. Ext.: 206<br>mailto:ajusto@feuga.es<br><br>https://es.linkedin.com/in/almudena-justo-martínez-2a5ba416/es |

| Partner: | Contact details: |
|---|---|
| t2i trasferimento tecnologico e innovazione | **t2i - trasferimento tecnologico e innovazione s.c. a r.l.**<br>Piazza delle Istituzioni, 34/a Building M (Area Appiani)<br>31100 Treviso, Italy<br>http://www.t2i.it<br><br>**Marco Battistella**<br>I&TT Project Manager<br><br>Phone +39 0422 1742129<br>Fax +39 0422 608866<br>marco.battistella@t2i.it<br><br>it.linkedin.com/pub/marco-battistella |

# susmilk

## RE-DESIGN OF THE DAIRY INDUSTRY
# FOR SUSTAINABLE MILK PROCESSING

The research leading to these results has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration within the SUSMILK project, grant agreement n° 613589