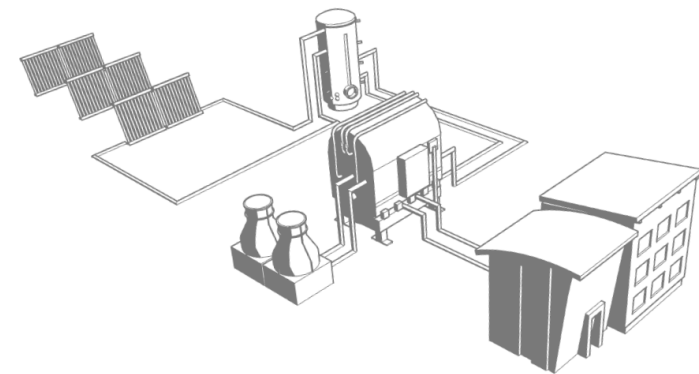# IEA SHC TASK 53
Workshop
Subtask A

Tim Selke

Workshop on
   The New Generation Solar Cooling & Heating Systems
   (PV or solar thermally driven systems) / IEA SHC Task 53

Leonardo da Vinci Hotel Rome Airport Hotel,

Wednesday, September 23, 2015, 14.00 – 17.30 hrs

IEA SHC TASK 53 - Workshop in Rom

Subtask A
What is it about?

- What is the state-of-the-art market available products and upcoming R&D?

- What system configuration do exist und fit for what application?

- What are the benefits of NG Systems in comparison to conventional solution?

Quelle www.oew.org

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Subtask A
What is the outcome in 2017

Expected results:

- State-of-the-art of commercially available products systems

- Technical report on newest R&D activities

- Technical report of best practice of energy storage integration

- Classification of NG SHC systems by scare view approach

- Techno-economic report on solar thermally and PV driven systems including Lifecycle Analysis

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Subtask A

- **Reference** Leader AIT

    - 3 different building types

    - 3 climates

    - 3 different distribution systems

    - Sensible - latent load

Reference systems

- Split unit and gas boiler

- Reversible air-coupled heat pump

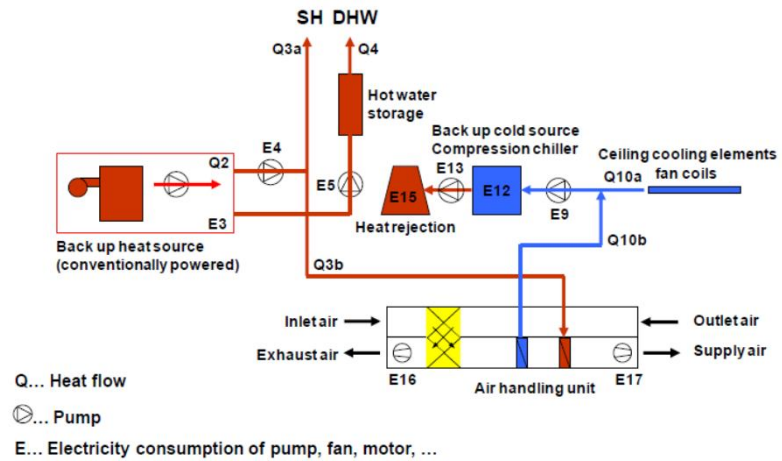- Reversible water-coupled heat pump

Figure 2-3 Diagram of the selected conventional reference systems including energy flows

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IEA SHC TASK 53

Subtask A
What systems do we have?

NG systems market available	R&D Systems close to Market
PV (Cooling/ Heating)	**PV (Cooling/ Heating)**
▪ COSSECO (CH)	▪ ATISYS / PV cooling (F)
▪ FREECOLD new PV split unit (F)	▪ Helioherm
▪ Chinese System PV MIDEA	
Solar thermal (Cooling/ Heating)	**Solar thermal (Cooling/ Heating)**
▪ YAZAKI (JP)	▪ FREESCOO (I)
	▪ ClimateWELL (S)
	▪ SolabCOOL (NL)

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Subtask A

- New Generation Systems Leader Tecsol

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Subtask A

- Storages Leader HEFR Switzerland

- Thermal energy storage methods

  - Sensible heat
  - Phase change storage
  - Chemical reaction

- Electrical energy storage methods

  - Super capacitor
  - Superconducting Magnetic Energy
  - Flywheel
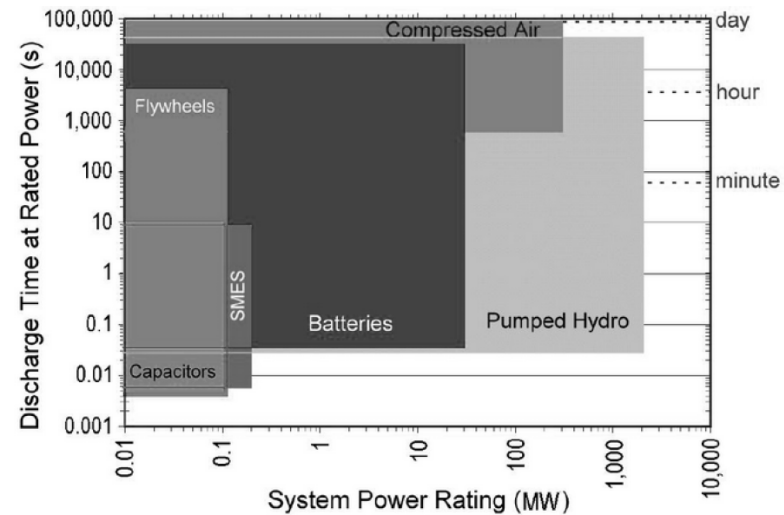 - Batteries
  - Batteries Redoxflow
  - ..

Figure 15: Means of stationary electricity storage according to their time of discharge and typical power
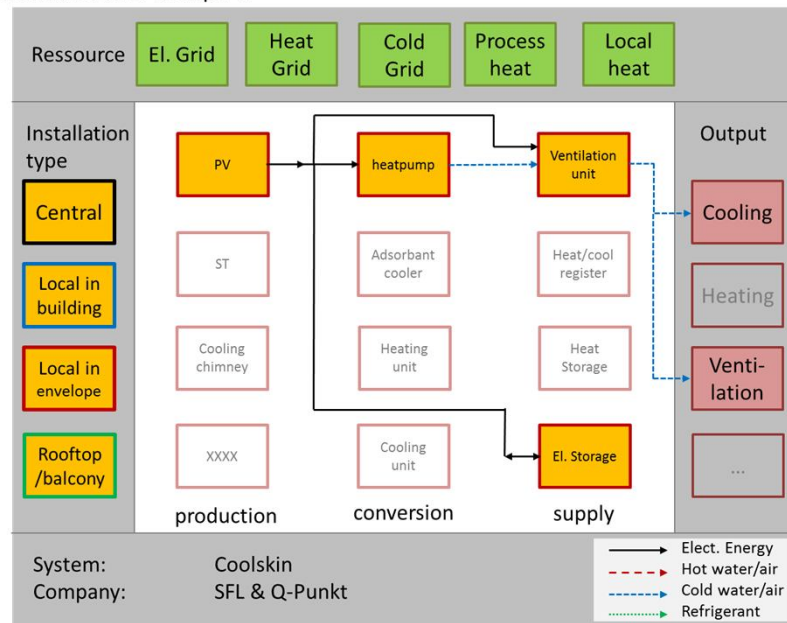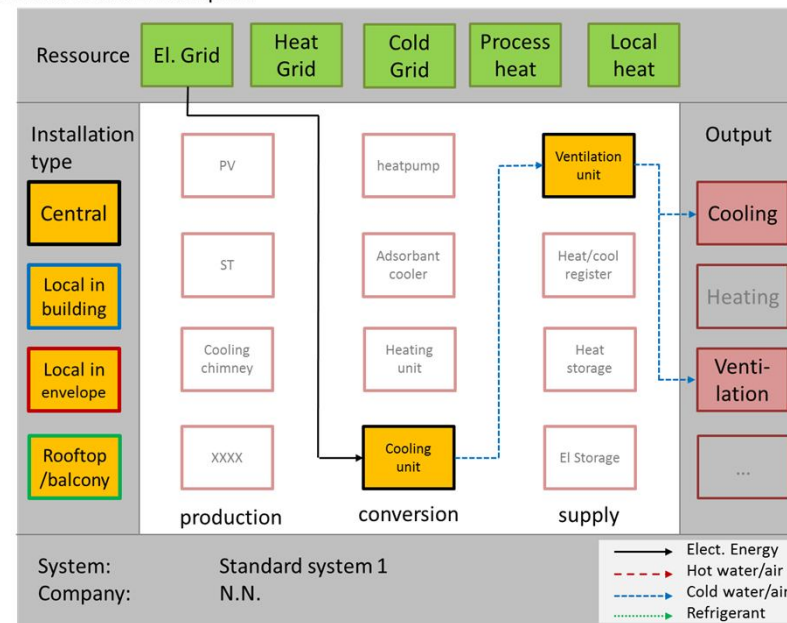
Source: *http://www.climatetechwiki.org/technology/jiqweb-es-fw*

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Subtask A

- System Integration Leader AIT

Schematic Draft 2: Example 1

Schematic Draft 2: Example 2

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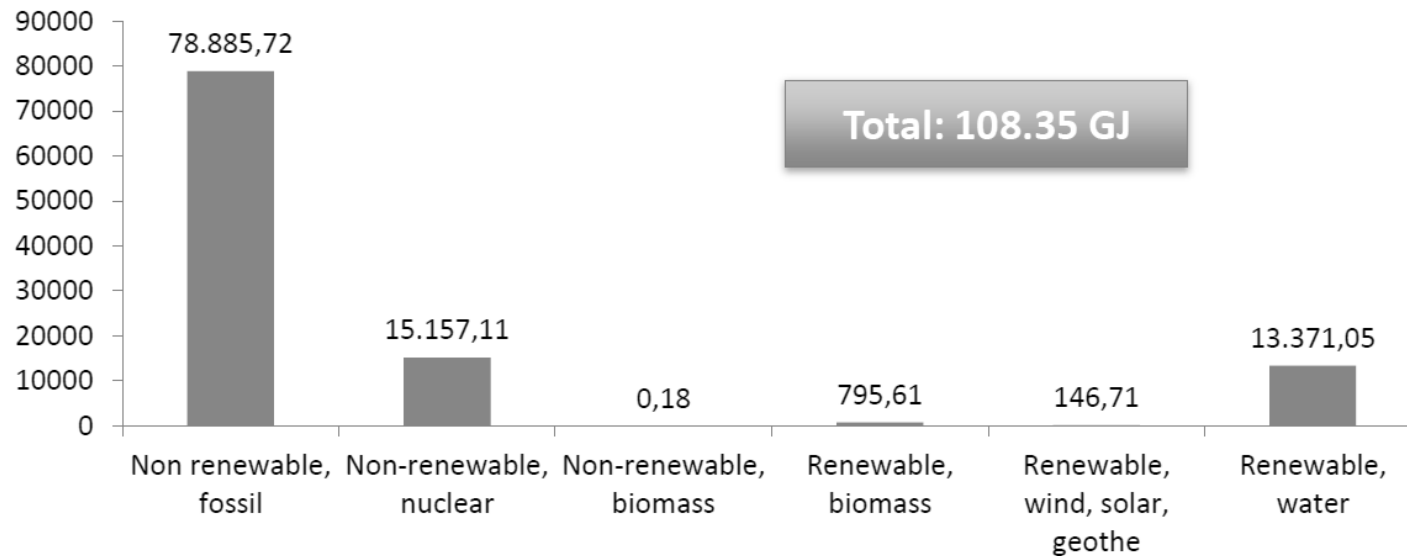Wednesday, September 23, 2015

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Subtask A

- ### LCA and Techno-ECO Analysis Leader Uni Palermo

  - Already 2 Italian NG cooling systems R&D analyzed
  - Literature review on existing LCA
  - At least 2 LCA on NG Cooling systems

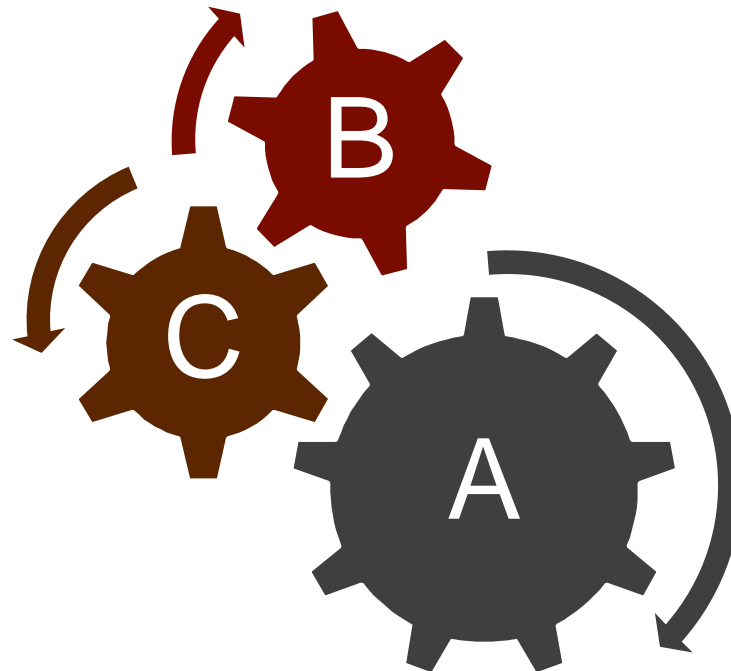**Air handling unit desiccant cooling (AHU-DEC): first results**

Primary energy consumption (MJ) for the manufacturing step

Total: 108.35 GJ

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Subtask A

- Work in progress

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your ingenious partner

Tim Selke

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