Design is not a straight line

Challenges in ecobuildings

Marco Citterio
Ente per le Nuove Tecnologie,
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Aim of presentation

- To underline some aspects in design process of ecobuildings, well known by people involved in this kind of task, but not always well known by some partners interacting in the process
- To present some outcomes of “Concept Development” of BRITA in PuBs Demoprojects

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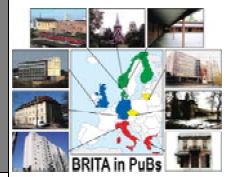
BRITA in PuBs eco buildings

Project n°: TREN/04/FP6EN/S07.31038/ 503135

Acronym: BRITA in PuBs

Title: Bringing Retrofit Innovation to Application in Public Buildings– BRITA in PuBs



Instrument: Integrated project

Thematic Priority: 6.1.3.2.1 ECO-BUILDINGS

D8
Reports on the concept development of the demonstration buildings in BRITA in PuBs

Revision: **1**

Due date of deliverable:	**31/10/2005**	Actual submission date:	**X/X/2005**
Start date of project:	**1/5/2004**	Duration:	**48 months**

Lead contractor name for this deliverable and organisation:
Marco Citterio
ENEA

Project coordinator name and organisation:
Hans Erhorn
Fraunhofer Institute of Building Physics

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	**PU**
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)	

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Ecobuilding

- Ecobuilding is, among other facts, a building that works in closer contact with the environment
- To be defined “Ecobuilding”, buildings need integration of: RES, energy efficient systems and efficient envelopes.
- Designers have then to take into account interactions between
  - building and climate
  - building and plants
  - plants and users
  - users and building

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Design process

- Design process of Ecobuildings is then much more complex than design process of usual buildings, where different systems are less interconnected.
- Many variables are, contemporarily, on the table.
- Many knowledge have to be exchanged between different actors.

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Integrated approach…

- Integrated approach is a prerequisite of ecobuildings design. Lack of design tools is crucial and still an open issue
- This lack is usually overtaken with closer cooperation between architects and engineers.
- Design process becomes iterative.

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..in retrofitting buildings

- What was considered solved in a previous round can change during the following round, or, even more frequently, the solution of a problem opens another problem.
- That is specially true in case of retrofit: real situation is rarely well known at the beginning.
- In some cases real situation becomes evident when the design phase is at an advanced stage, and part of the work already done has to be cancelled.

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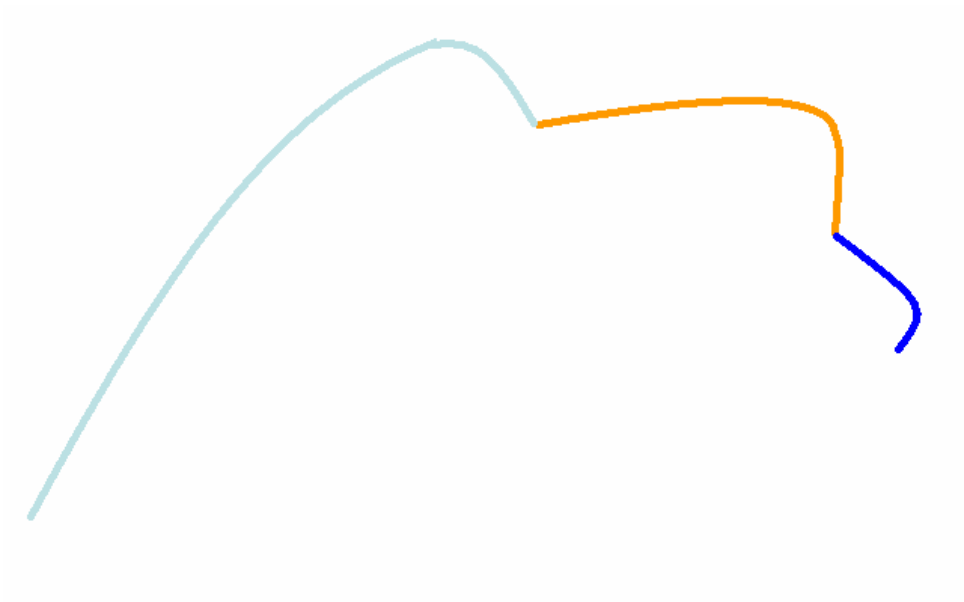
Can, in this context, the design process of an ecobuilding be compared to a straight line?



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Problems or challenges? Experiences in BRITA

- Arising problems in ecobuildings design phase were, in some cases, the opportunity to explore alternative solutions: in some cases the first and most obvious solution wouldn't have been the best one.
- In some cases "the barrier" was not to find the technical solution but achieve, in reasonable time, the approval of all the partners involved.
- Finding adequate technical solutions is, definitely, less time expensive and tiresome than convincing all the partners of the opportunity of choosing the new solution.
- "*pushing and trying hard enough you can move "what is possible" quite a bit further than what is first indicated by building designers and contractors" (from "Proevehallen Lessons learned".)*

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Problems or challenges?

- Facing up to these challenges should require flexibility, open mind and *decisional rapidity* in all the partners involved:
  - Energy consultants
  - Building designers
  - Building owners
  - Authorities

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Challenges typologies

- Financial challenges
- Challenges inherent with the design process
- Challenges in building structure
- Challenges for architectural influences and “listed buildings”
- Challenges for uncertainty or modifications of boundary conditions
- ……

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Some examples of design path changing in BRITA demoprojects

"How wind can change direction"

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Filderhof Stuttgart (Germany)

Common Symposium of EU FP6 Eco-buildings Projects, Berlin, 22/23 November 2005
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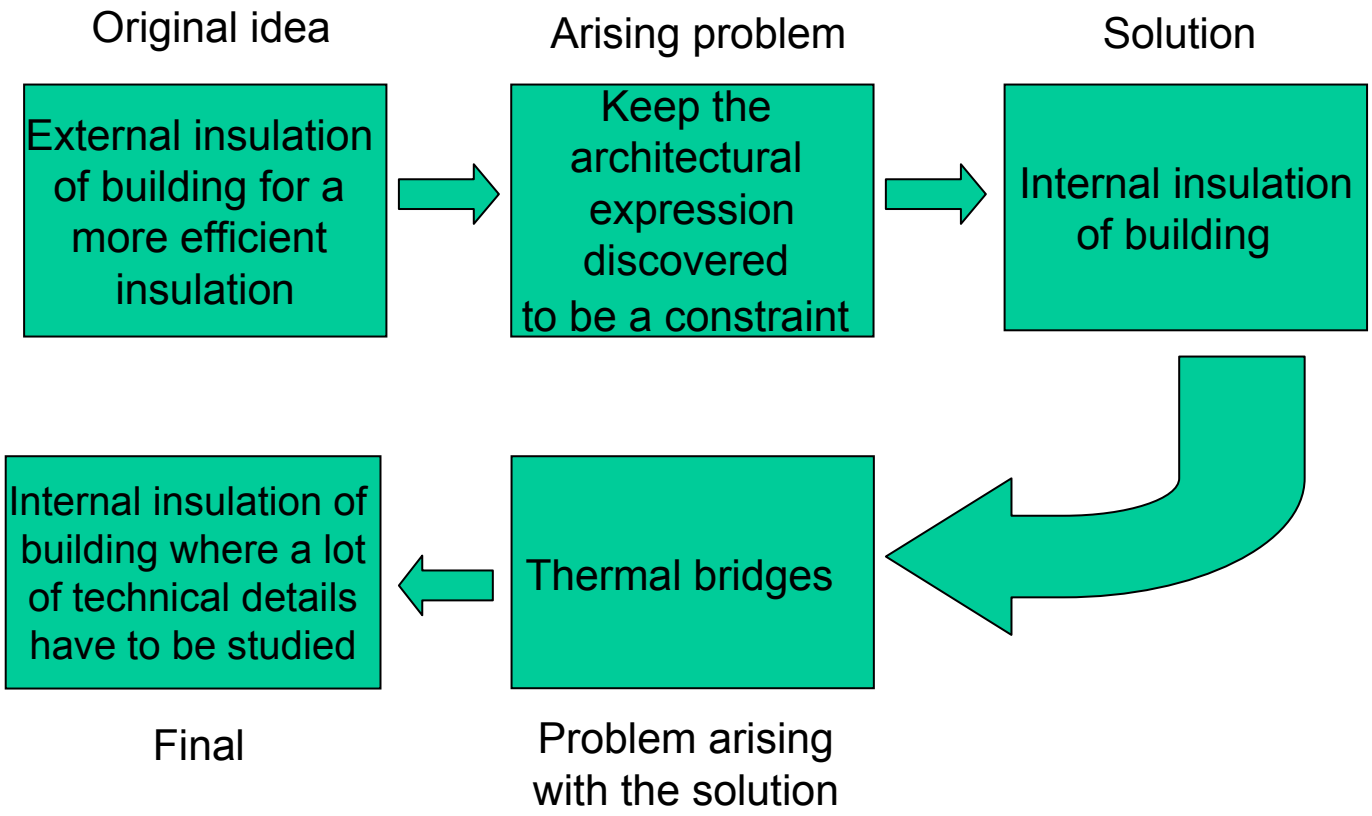

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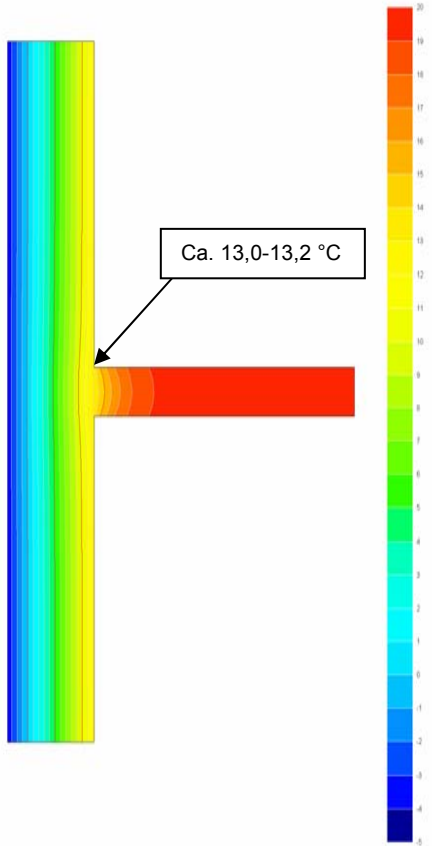
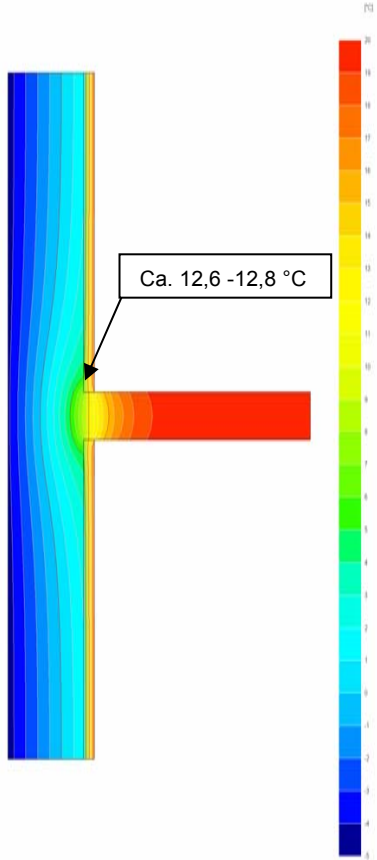
Anschluss Innenwand an Außenwand ohne Dämmung



Anschluss Innenwand an Außenwand **mit** 5 cm Dämmung



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Prøvehallen Copenhagen (Denmark)

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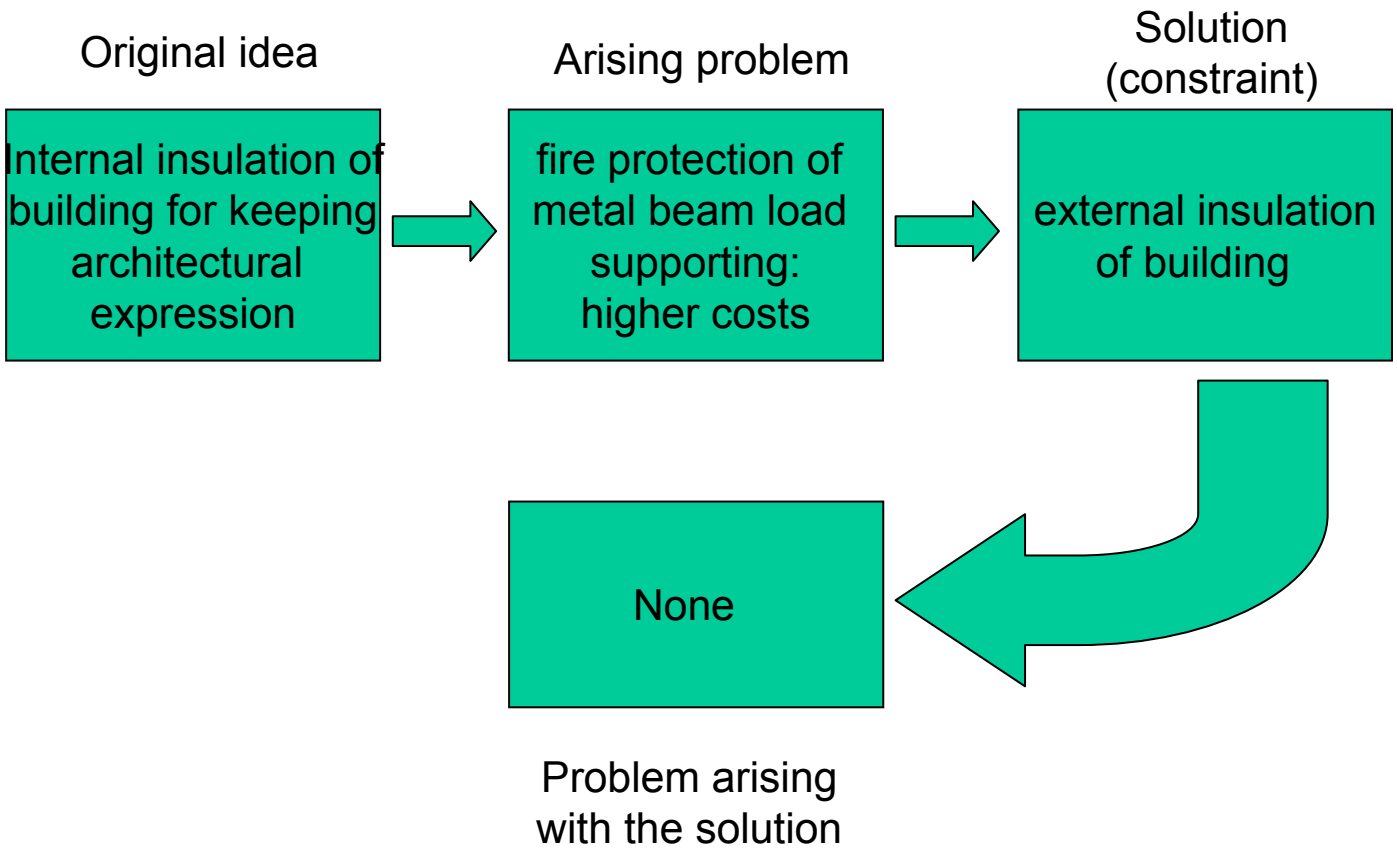

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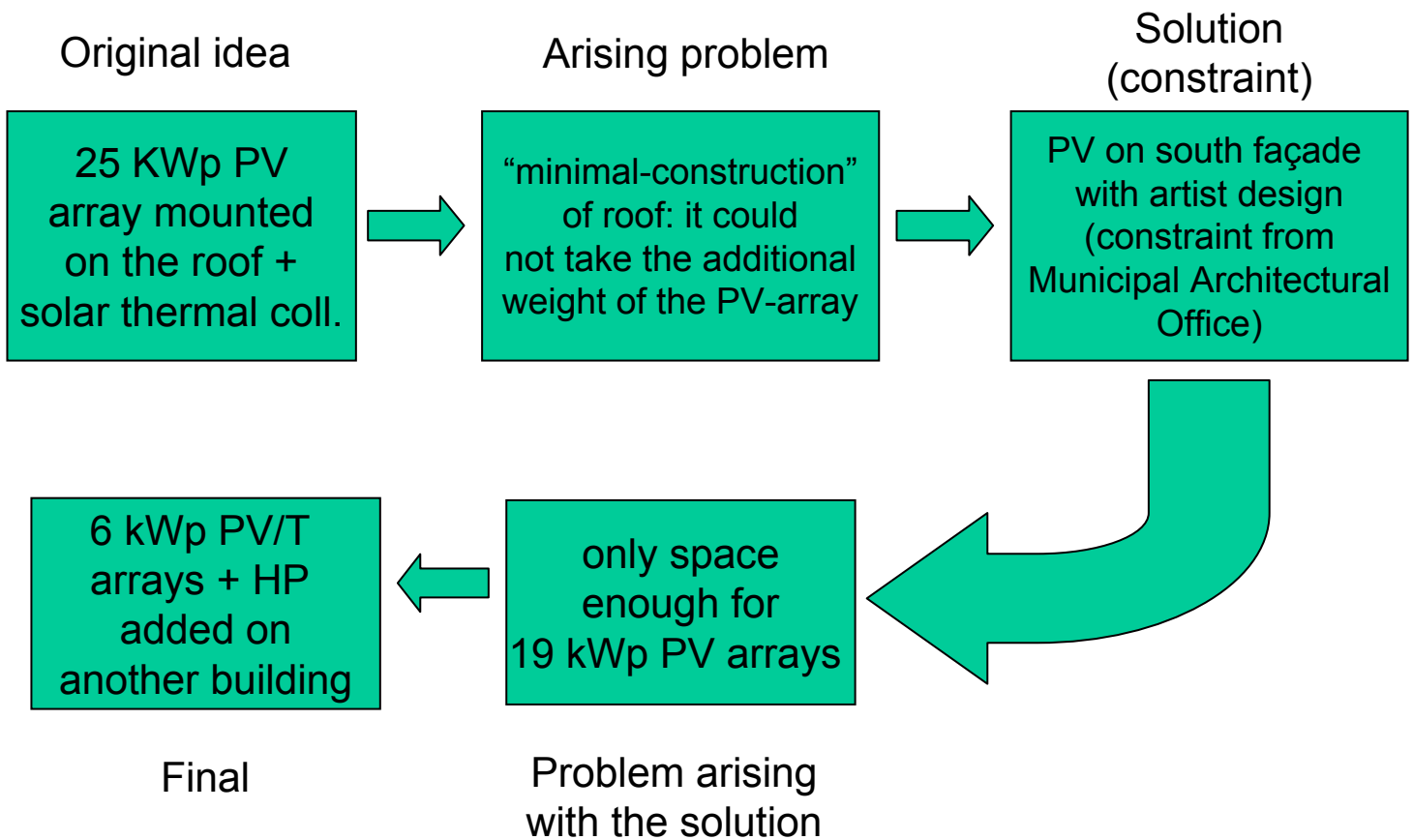

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Brewery Brno (Czech)

Common Symposium of EU FP6 Eco-buildings Projects, Berlin, 22/23 November 2005
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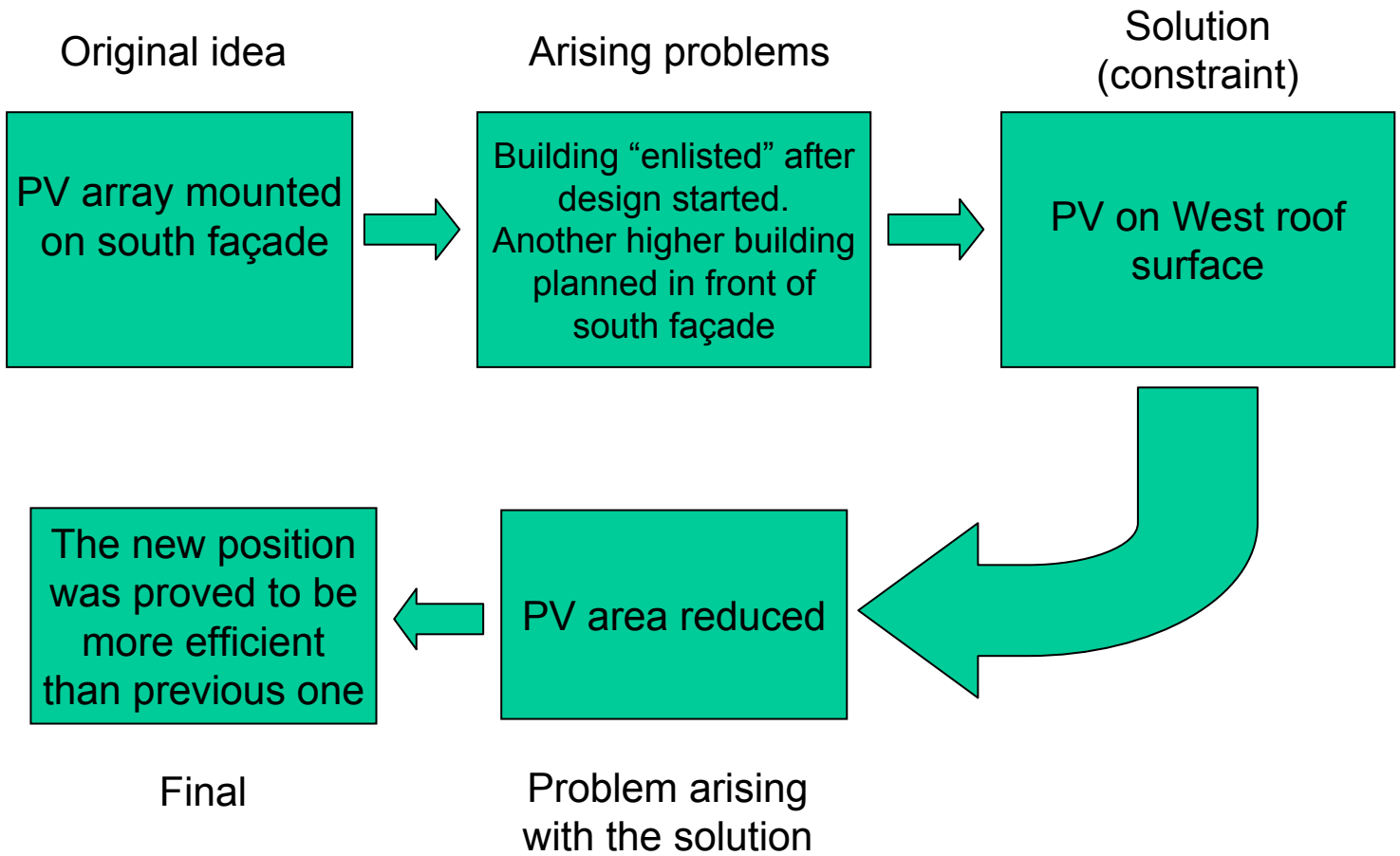

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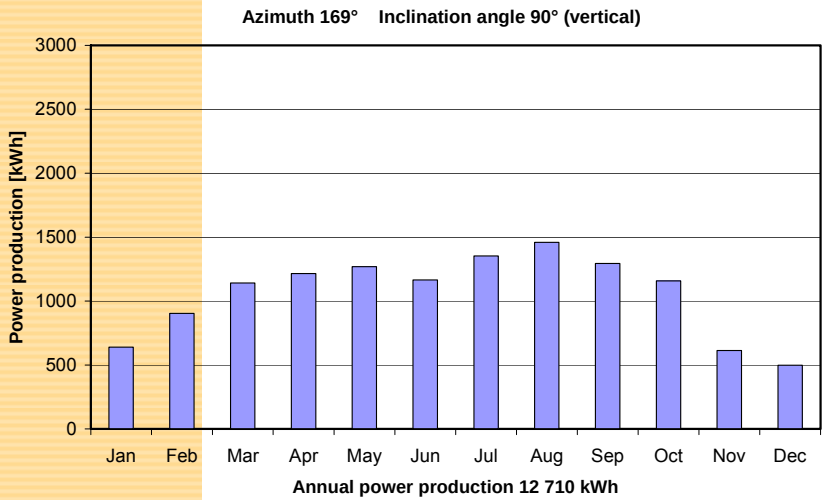
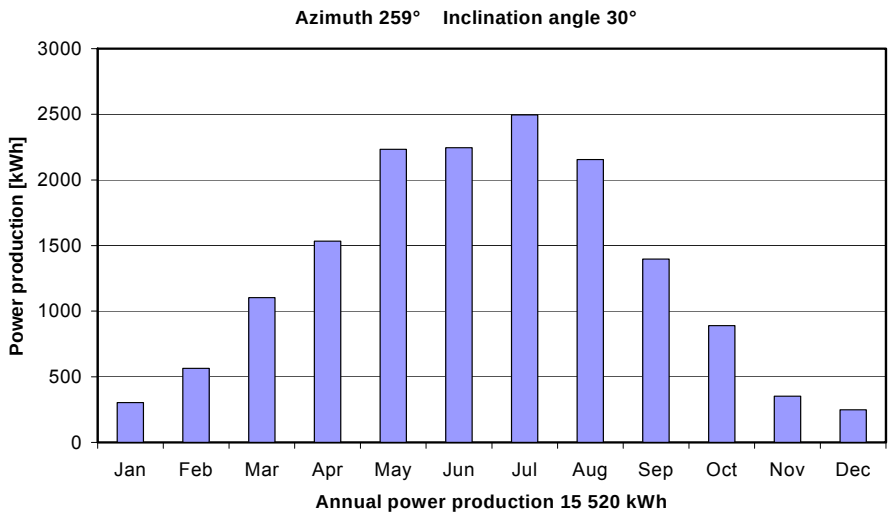
Brewery: PV location comparison





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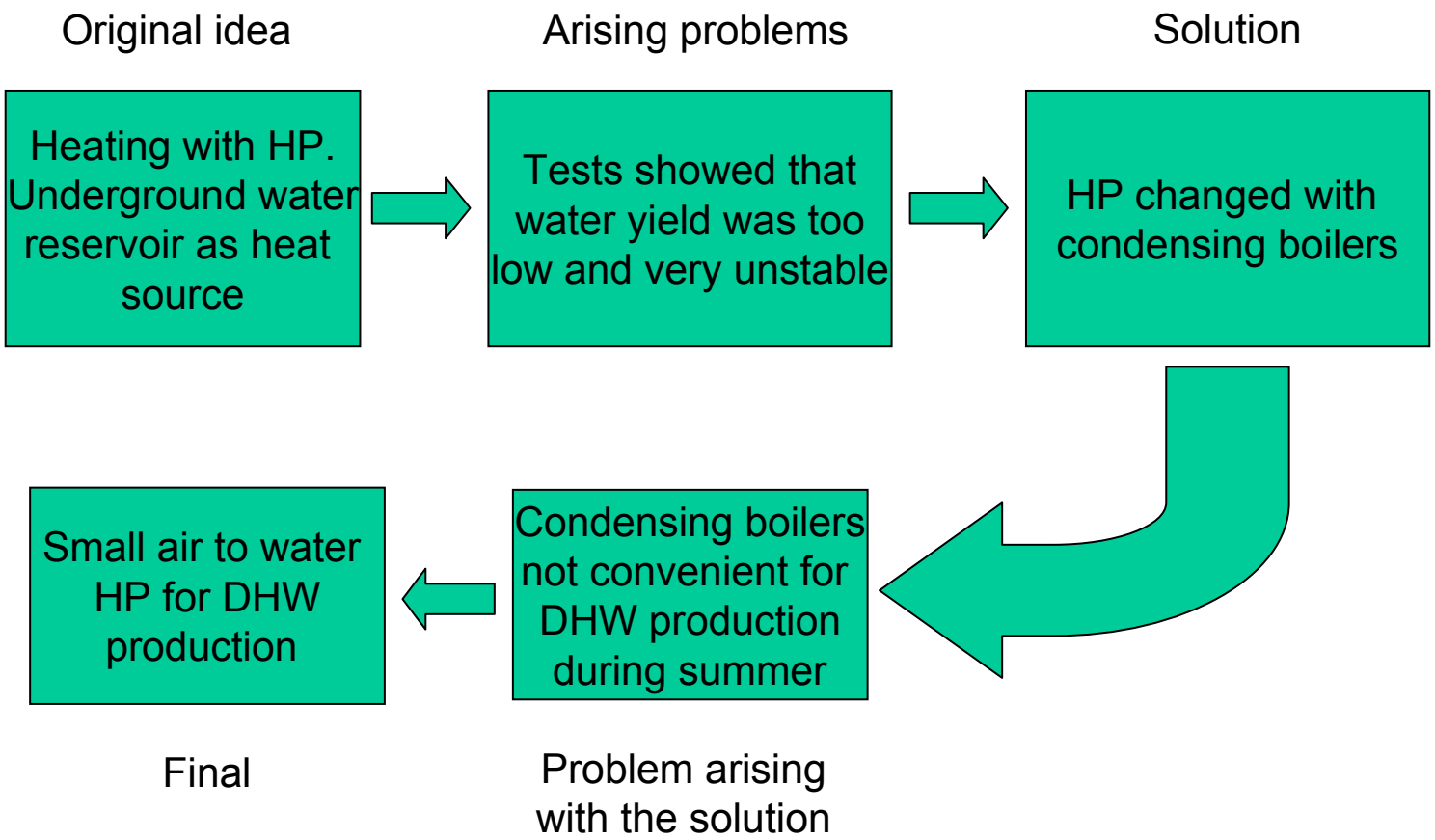
Brewery Brno (Czech)



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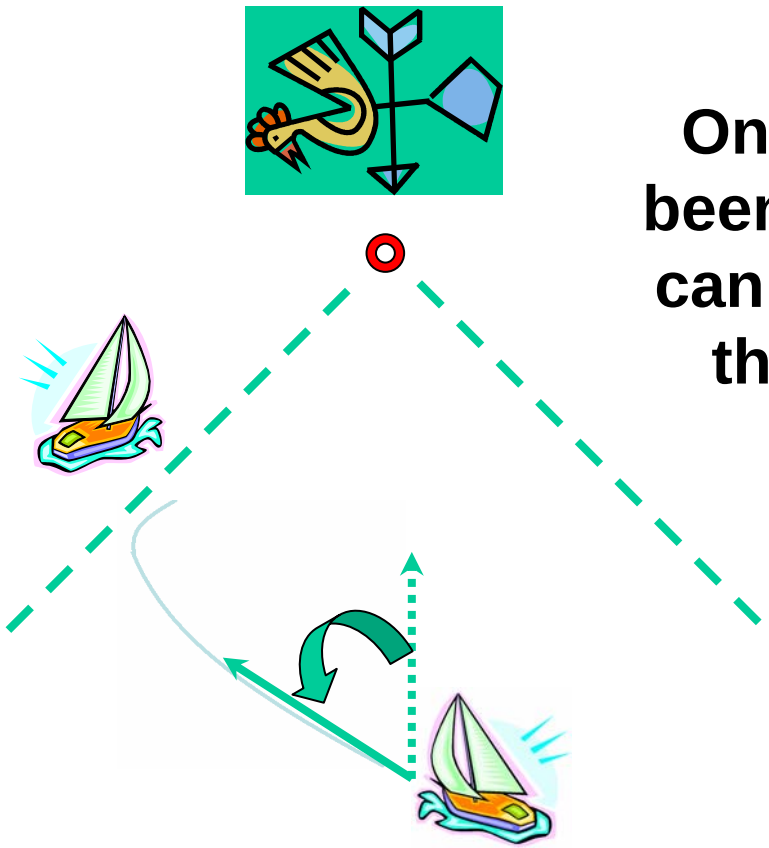
Design track is similar to the track of a sailboat getting up to an upwind target



Once layline has been reached, boat can sail directly to the target but..

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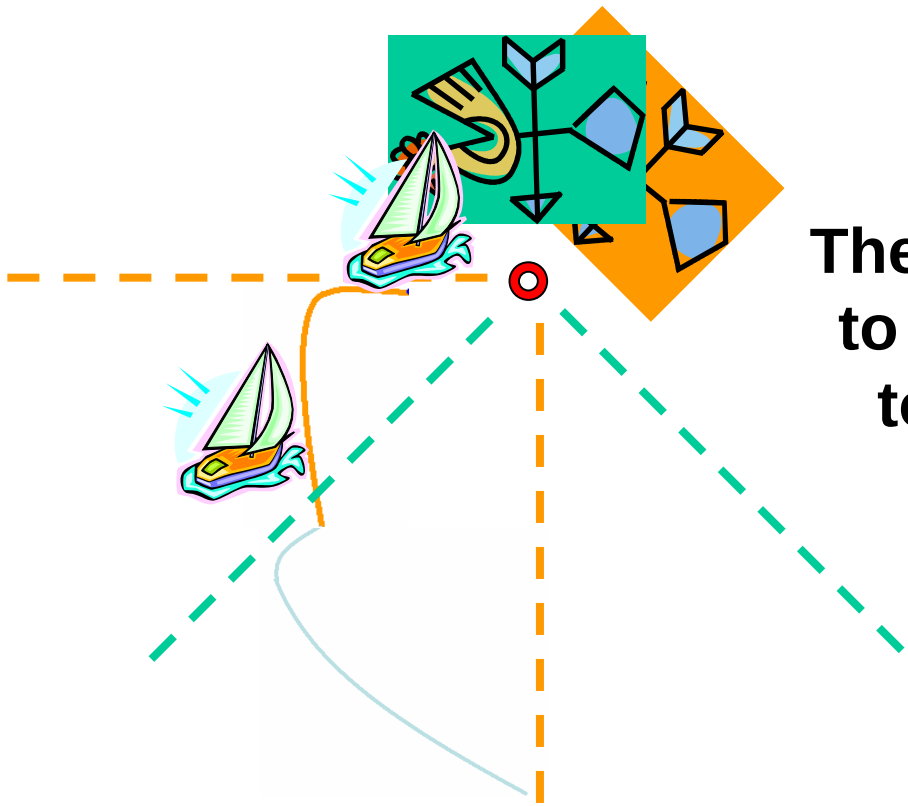
….wind direction can change..



The skipper has then to change his track to reach the new layline

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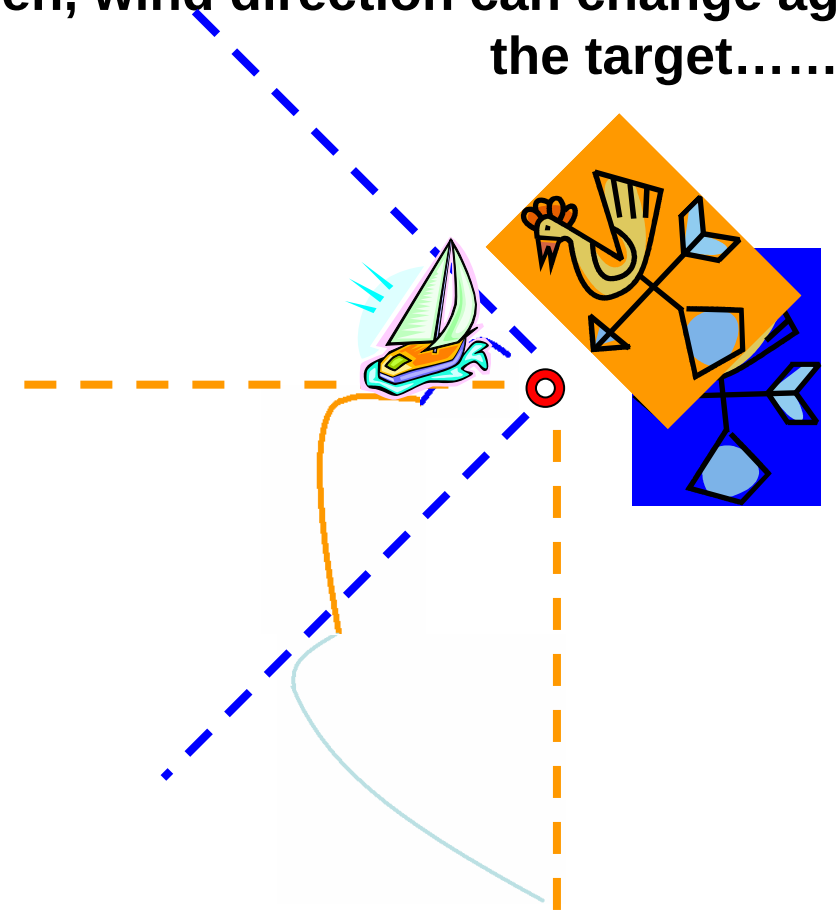
Then, wind direction can change again, even in vicinity of the target……



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Sometime sailing can become rough…

4 Demoproject in BRITA needed to ask modifications

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Or the boat can sink…

one demoproject in BRITA was cancelled due funding uncertainties: no substitution allowed

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Lesson learned:
as a sailboat, an ecobuilding project needs *to have a clear target*, shared amongst all the partners

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"Wer nicht weiß, welchen Hafen er anlaufen soll, bekommt keinen günstigen Wind"

“If you don't know to which port you are sailing, no wind is favorable”

“Ningún viento es favorable para el que no sabe a que puerto va”

“Il n'y a point de vent favorable pour celui qui ne sait dans quel port il veut arriver ”

“Jestliže nevíš do kterého přístavu pluješ, žádný vítr není příznivý”

“Hvis du ikke ved hvilken havn, du vil sejle til, er der ingen foretrukken vindretning”

“Jei nežinai, į kurį uostą plauki, joks vėjas nebus palankus”

“Para quem não sabe a que porto se dirige, não há vento favorável”

“Non esiste vento favorevole per il marinaio che non sa dove andare”

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Buon Vento!

Thanks to all demo partners of BRITA in PuBs
for their kind assistance in providing information
for this presentation

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