

# IEA SHC Task 40/ECBCS Annex 52

## Towards Net Zero Energy Buildings

<http://www.iea-shc.org/task40/>

### STC

Advanced Building Design,  
Technologies and Engineering

Introduction to Analysis Matrix  
October 6<sup>th</sup>, 2011

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**Project Name:** Primary School Novale

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roberto.lollini@eurac.edu

**Building Information:**

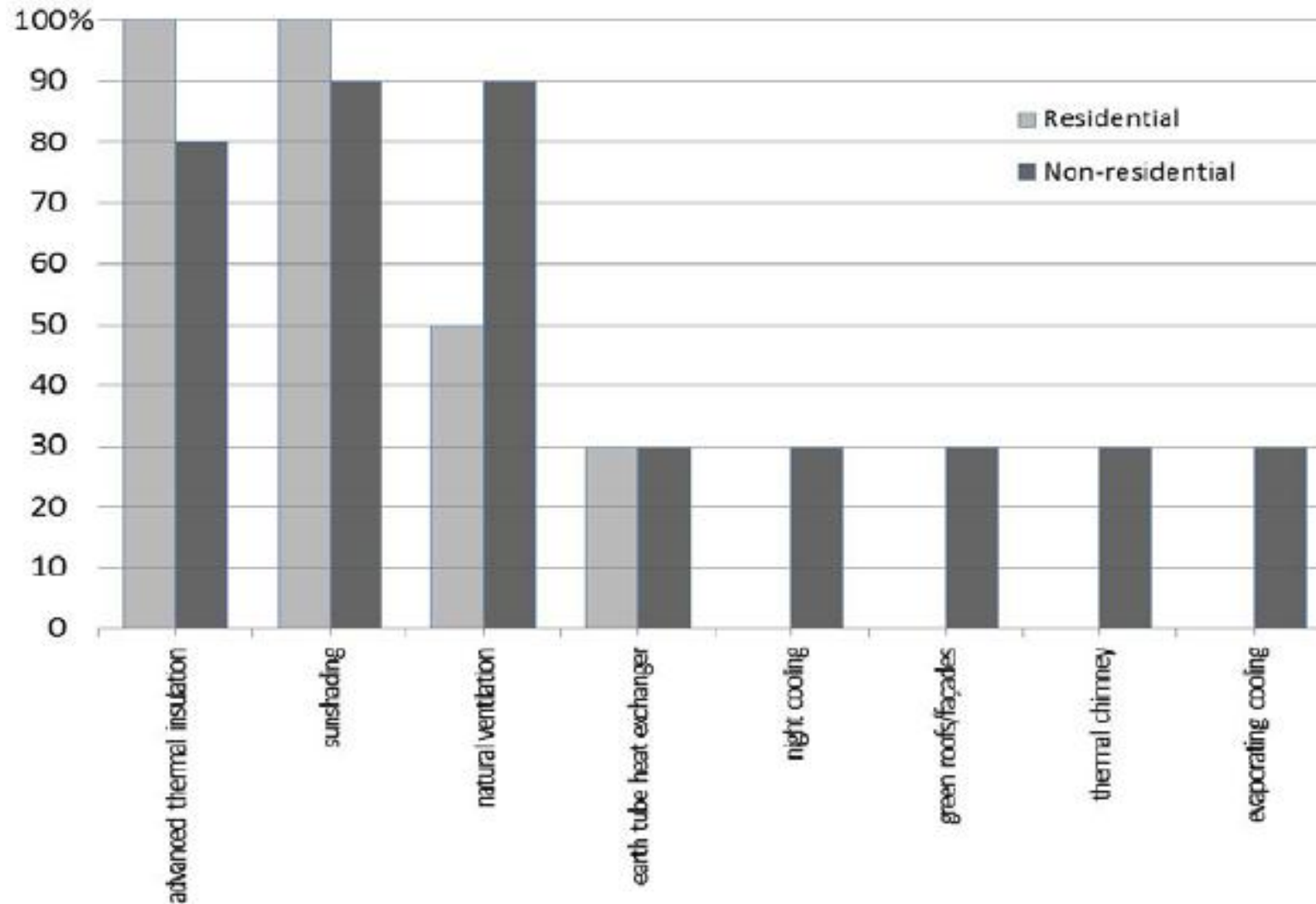
- Building Status: 2006
- Location: 141Novale Laion/La Bolz Italy
- Latitude: North 46° 36' 34" N

# ANALYSIS MATRIX/SOLUTION SETS?

| Residential buildings                     |   |  |  | Non-residential buildings    |   |                                 |   |
|---|---|--|--|------------------------------|---|---------------------------------|---|
| <b>1 Le Soleil</b><br>Canada              |    | <b>2 Riehen</b><br>Switzerland         |    | <b>11 La Jon</b><br>Italy    |    | <b>12 Solar XXI</b><br>Portugal |    |
| <b>3 ÉcoTerra</b><br>Canada               |    | <b>4 Avalon</b><br>Canada              |    | <b>13 Pixel</b><br>Australia |    | <b>14 Acciona</b><br>Spain      |    |
| <b>5 Green to tomorrow</b><br>South Korea |    | <b>6 Blaue Heimat</b><br>Germany       |    | <b>15 Benasque</b><br>Spain  |    | <b>16 RSF</b><br>USA            |    |
| <b>7 Leaf House</b><br>Italy              |  | <b>8 Little Greenie</b><br>New Zealand |  | <b>17 Solon</b><br>Germany   |  | <b>18 Enerpos</b><br>France     |  |
| <b>9 Robert Ryan</b><br>UK                |  | <b>10 Lima</b><br>Spain                |  | <b>19 Solvis</b><br>Germany  |  | <b>20 Oberlin</b><br>USA        |  |

6th Experts Group Meeting, October 5 - 7, Basel, Switzerland

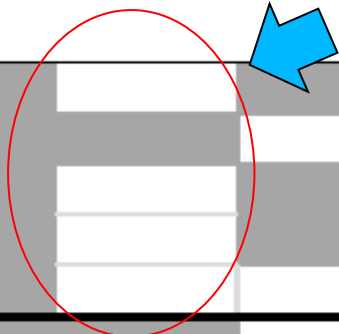
# ANALYSIS MATRIX/SOLUTION SETS?



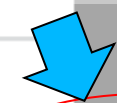
*Relevance of passive cooling measures across 20 case study buildings*

|  | Passive solutions for cooling | Passive solutions for cooling |            |                     |                           |               |                     |                 |                     |  |
|--|-------------------------------|-------------------------------|------------|---------------------|---------------------------|---------------|---------------------|-----------------|---------------------|--|
|  |                               | advanced thermal insulation   | sunshading | natural ventilation | earth tube heat exchanger | night cooling | green roofs/façades | thermal chimney | evaporating cooling |  |
| Residential buildings                        | Abondance Montreal            |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Little Greenie                |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Green tomorrow                |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Leaf House                    |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Lima                          |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Riehen                        |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Avalon                        |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Blaue Heimat                  |                               |            |                     |                           |               |                     |                 |                     |  |
|  | ÉcoTerra Home                 |                               |            |                     |                           |               |                     |                 |                     |  |
|  | RobertRyan                    |                               |            |                     |                           |               |                     |                 |                     |  |
| <b>Heating and Cooling Dominated Climate</b> |                               |                               |            |                     |                           |               |                     |                 |                     |  |
| <b>Heating Dominated Climate</b>             |                               |                               |            |                     |                           |               |                     |                 |                     |  |
| Non-Residential buildings                    | Lajon-Italy                   |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Pixel                         |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Solon SE headquarters         |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Solvis                        |                               |            |                     |                           |               |                     |                 |                     |  |
|  | SolarXXI                      |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Acciona                       |                               |            |                     |                           |               |                     |                 |                     |  |
|  | RSF                           |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Enerpos                       |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Benasque                      |                               |            |                     |                           |               |                     |                 |                     |  |
|  | Oberlin                       |                               |            |                     |                           |               |                     |                 |                     |  |
| <b>Heating and Cooling Dominated Climate</b> |                               |                               |            |                     |                           |               |                     |                 |                     |  |
| <b>Cooling Dominated Climate</b>             |                               |                               |            |                     |                           |               |                     |                 |                     |  |
| <b>Heating Dominated Climate</b>             |                               |                               |            |                     |                           |               |                     |                 |                     |  |

Natural ventilation less effective!



Thermal insul. not needed!

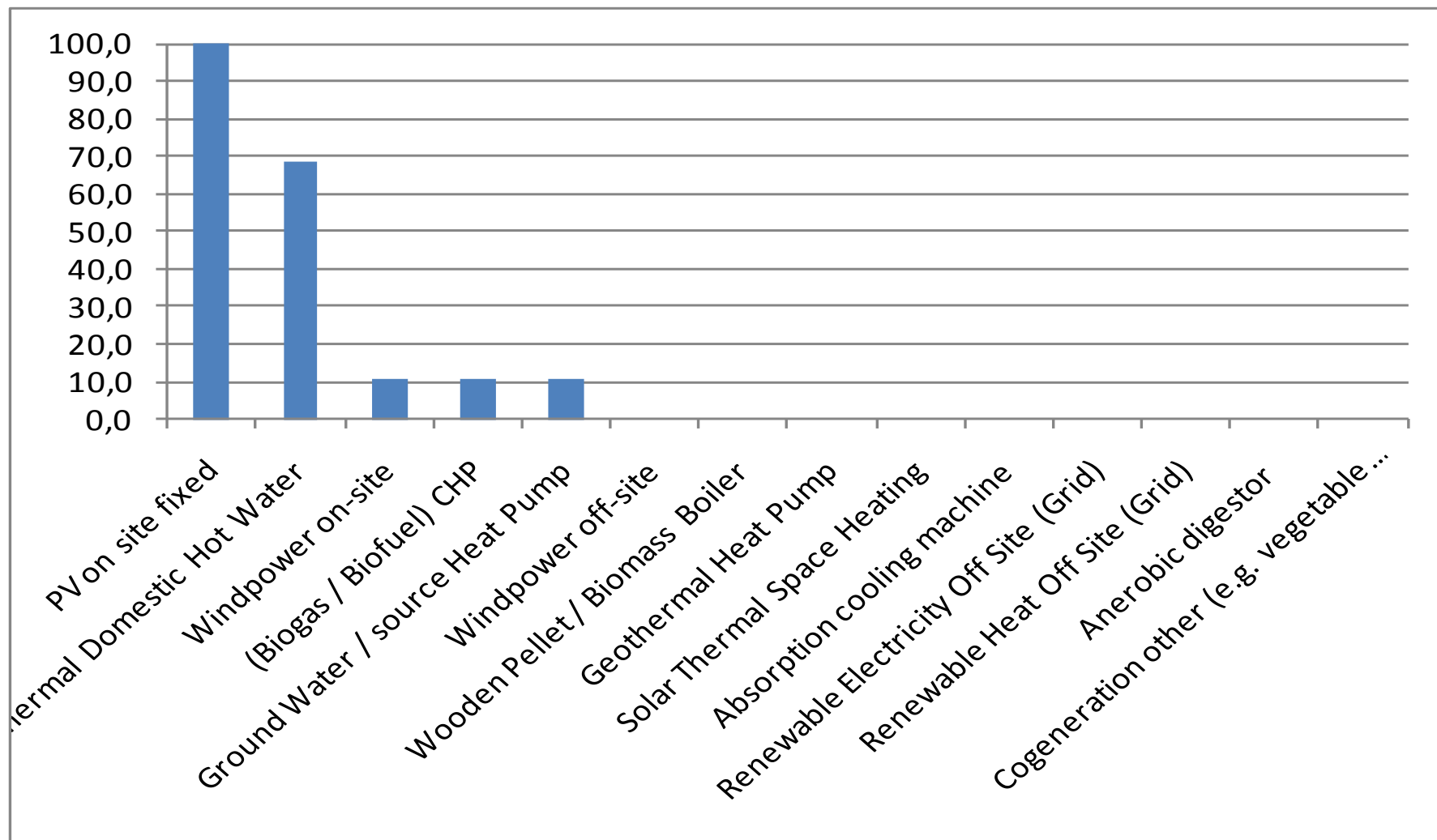


Massive rejection due to lack of HVAC



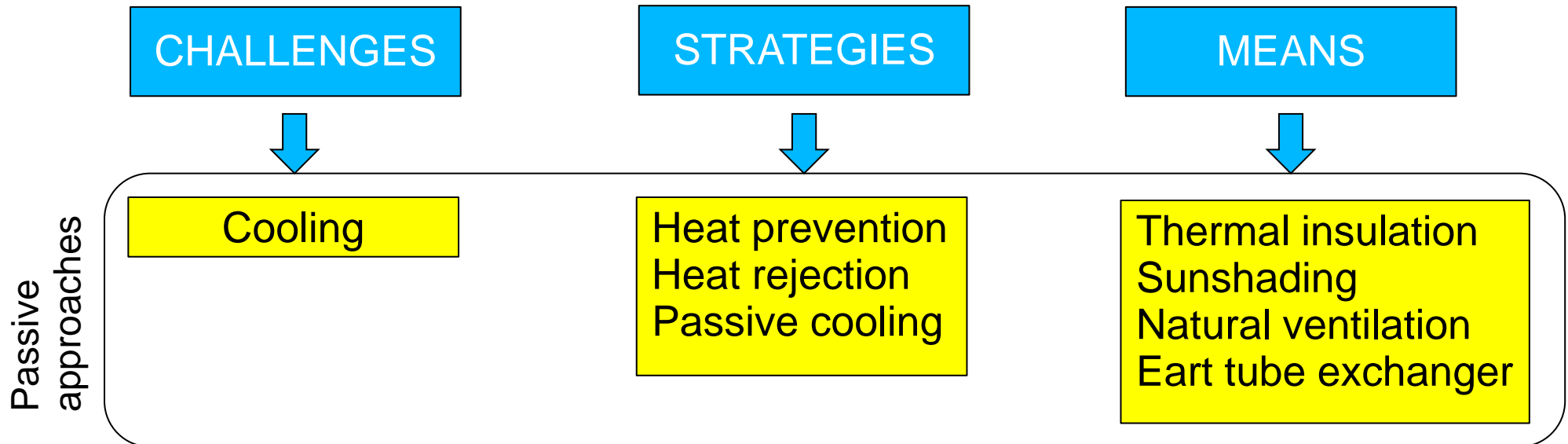
Passive cooling measures across 20 case study buildings

# A. Preliminary description of RES adopted by NZEBs – (COLORADO)





## ANALYSIS MATRIX/ SETS OF ...?



**The combination of saving measures, energy efficient systems and renewable systems which are more likely to succeed to achieve a certain zero-energy performance under a specific type of climate.**

*(should result from research and lessons learned and not un-substantiated assumptions or guess works)*

