



# Task48 Subtask C results overview: Developing a market for solar cooling

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ENERGY FLAGSHIP  
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# How can we accelerate the market for solar cooling?



# Desired market transformation

More market pull Display labels that sell the dream of solar cooling

Reduce entry barriers Trusted, verifiable whole of life energy savings methodologies

- So buyers can value solar cooling on a fair basis
- Access to existing government incentive schemes

Raise the bar Detailed guides that promote good designs and operating procedures

# Policy/ Intervention Mechanisms

Subsidies (eg \$/kWh, \$/kW, \$/kVA)

Feed in tariff

Tradable certificate

Low interest loans

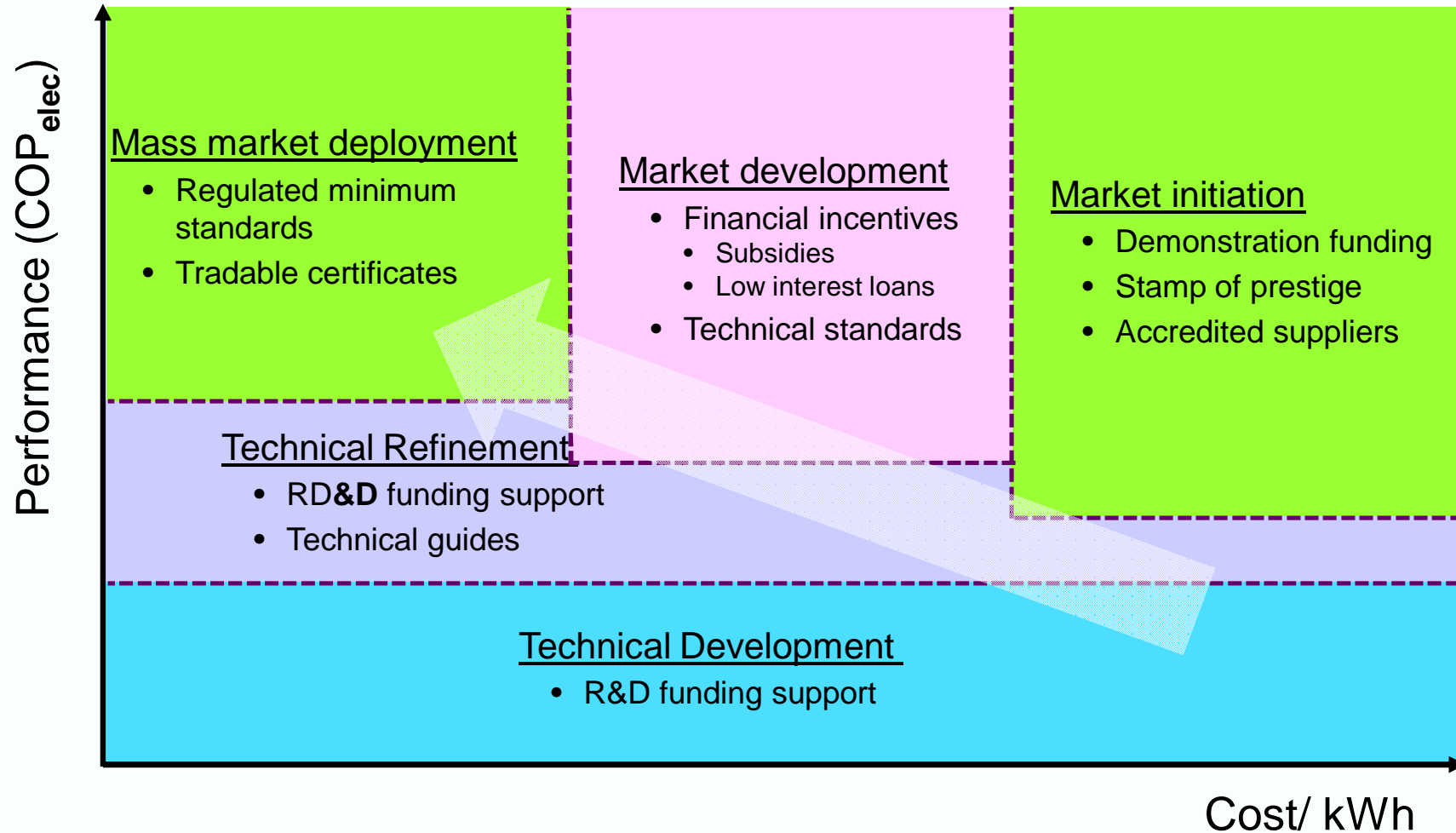
Stamp of prestige/ labelling

Lifecycle benefits information/  
awareness raising

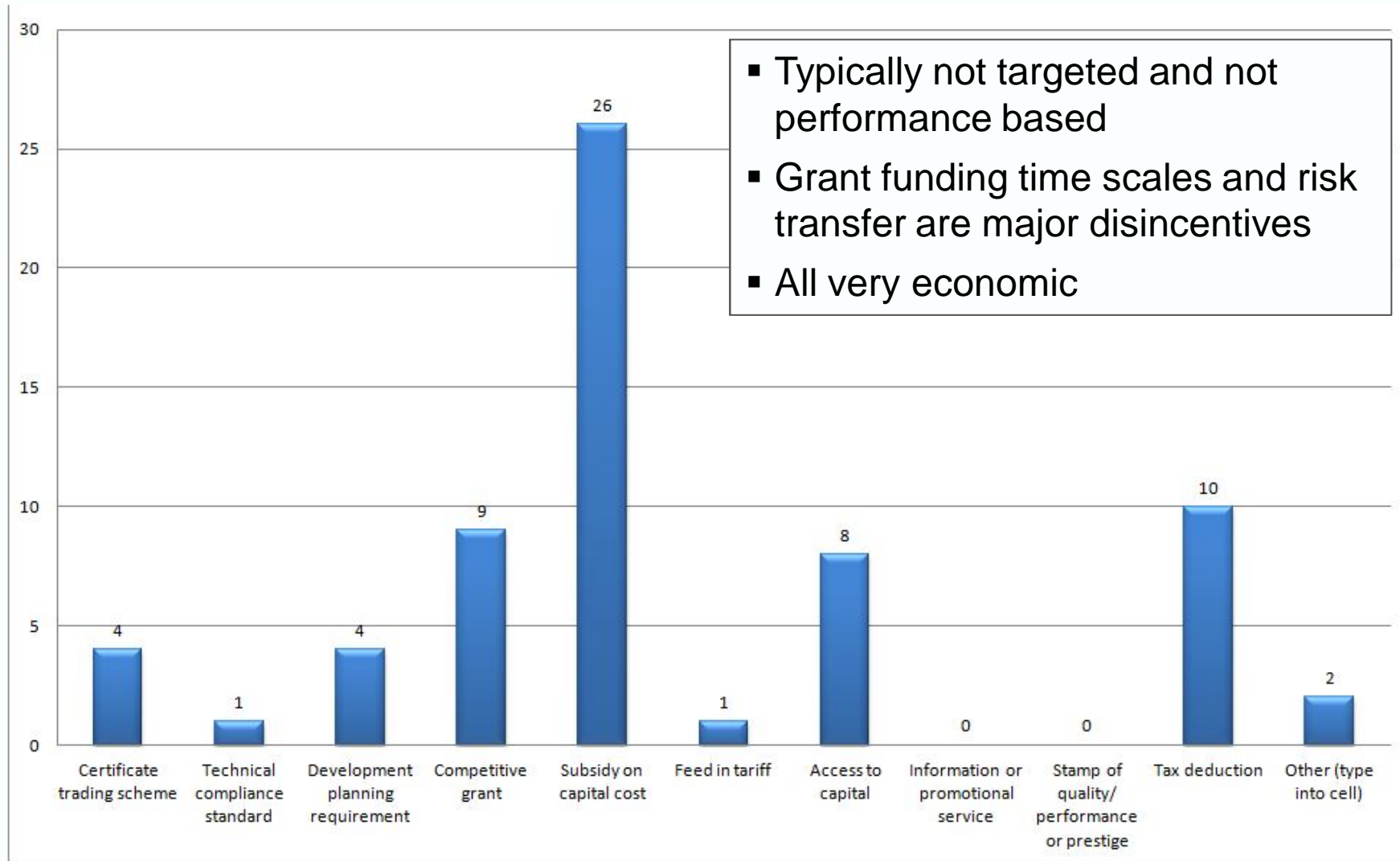
Mandatory compliance (eg min  
renewable content, accreditation)

- What restrictions should be placed on eligibility ?
  - Technology type
  - Performance
  - Supplier accreditation
- What is the benchmark
- How do you measure nega-watts ?

# Fit to Product & Market Development Need



# C1: Support mechanisms categories and usage





# C4: If you cant measure you can't...

..... Get paid, get recognised, improve your system..  
.....All of the above and more

## Contents

1. Executive Summary
2. M&V concepts and standards
3. Default system architectures
4. Monitoring nomenclature
5. Instrumentation
6. Procedures for key indicators, alarms and fault finding
7. Performance assessment



**Deliverable M-C4.3 – Final report Measurement and Verification Procedures**

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# Three qualification approaches

## Prescribed Engineering Design (>20kW) (prior to construction)

- Defined design (flowsheet, equipment selection - type and minimum performance, sizing rules etc)

## Measured Performance (>20kW) (after construction)

- Full design freedom
- Methodology for on-site performance quantification & verification

## “Deemed” Performance (<20kW) (before installation)

- Methodology for estimating expected savings
- Assessment based on simulation or laboratory measurement under standard conditions



# C3: Guide to replicating 3 best practice designs

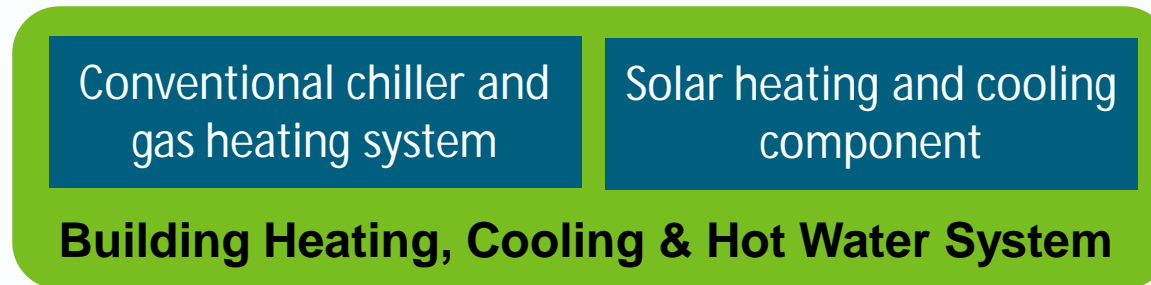
- Small scale NH<sub>3</sub>/H<sub>2</sub>O - INTEC/UIBK
- Medium scale 1<sup>e</sup> LiBr with DHW - TECSOL
- Large scale 2<sup>e</sup> LiBr – CSIRO

## Ten Commandments (qualitative and quantitative)

1. Choose applications where solar collector output can be utilized year round (eg DHW base load)
2. Avoid gas back-up to single effect chiller, heating of storage
3. Select solar collectors that can still deliver the required temperature at off-design radiation
4. Minimise heat losses (short pipe runs and good insulation)
5. Chiller should run for long hours without start/stop cycling
6. Minimise parasitic power (VSD's and high efficiency pumps/fans)
7. Keep it simple, easy to install, off the shelf parts. Avoid extra pump-around loops where possible

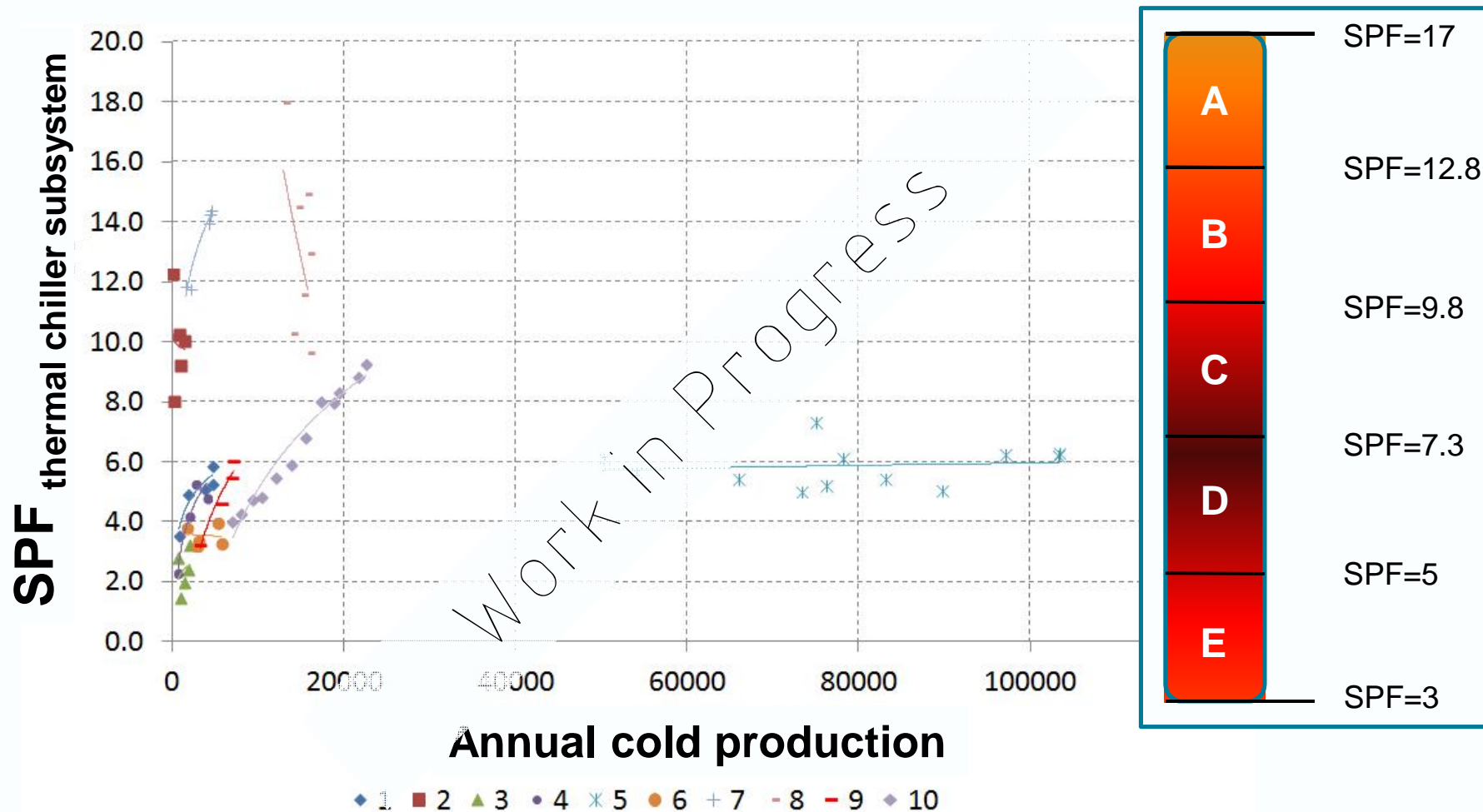
## C2: Rating systems on measured performance

- What are we rating ?



- Can we combine gas and electricity in common units ? Metric that compares with SEER ?
- What are we benchmarking against ?
  - What a solar system should be able to do ? Or
  - What a conventional system is able to do ?

# Calibrating a thermal cooling labelling scheme (need to incorporate heating)



# Conclusions

- Solar Heating and Cooling needs more recognition in government policies
- Current support mechanisms are not well targetted
- Performance based support will benefit the industry
  - compete on a level playing field with other renewables
- We are making the first steps toward
  - Performance based assessment of installed systems
  - Performance based design guidelines on what we know should work

# Thank You

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# The Work Packages

	Activity	Activity Leader
C1	Review of relevant international standards, rating and incentive systems	Daniel Rowe
C2	Methodology for performance assessment, rating and benchmarking	Stephen White
C3	Selection and standardisation of best practice solutions	Romain Sire
C4	Measurement and verification procedures	Francois Boudehenn
C5	Labelling possibilities investigation	Uli Jakob
C6	Contracting models	Moritz Schubert
C7	Certification process definition for small systems	Jochen Döll/ Matthias Schicktanz