



Solar Combi+



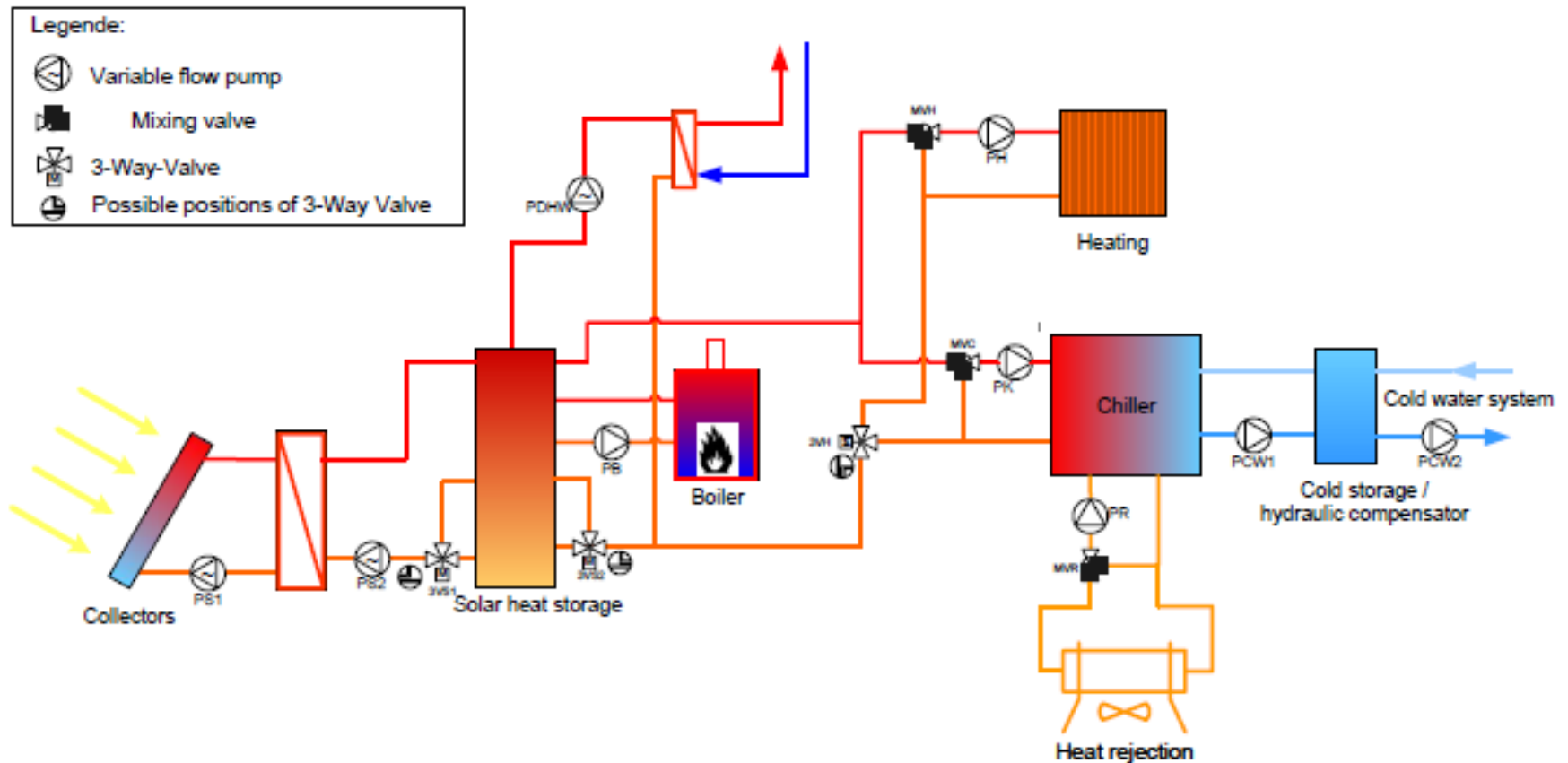
**Alexander Thür,
Dagmar Jähnig, Martin Vukits**

AEE – Institute for Sustainable Technologies (AEE INTEC)
A-8200 Gleisdorf, Feldgasse 19
AUSTRIA

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WP 3: Virtual Case Studies

6 System E1



$$A_{\text{cool}} \Leftrightarrow V_{\text{store}} / \text{CC and FC}$$

Pref – EAW SE15

CC: 13.39 kW

FC: 8.95 kW

Pref
m ² /kW
2
2,75
3,5
4,25
5

CC	
A_coll [m ²]	V_store [m ³]
67	5,0
67	3,3
67	1,7
57	4,3
57	2,8
57	1,5
47	3,5
47	2,3
47	1,2
37	2,8
37	1,9
37	1,0
27	2,0
27	1,4
27	0,7

FC	
A_coll [m ²]	V_store [m ³]
45	3,4
45	2,3
45	1,2
38	2,8
38	1,9
38	1,0
31,5	2,3
31,5	1,6
31,5	0,8
24,5	1,9
24,5	1,3
24,5	0,6
18	1,4
18	0,9
18	0,5

no vacuum tubes; no dry cooling; V_store: 25,50,75 ltr/m²

$$A_{\text{cool}} \Leftrightarrow V_{\text{store}} / \text{CC and FC}$$

Pref – EAW SE15

CC: 17.7 kW

FC: 13.8 kW

Pref
m ² /kW
2
2,75
3,5
4,25
5

Tmax: 90 => 95°C

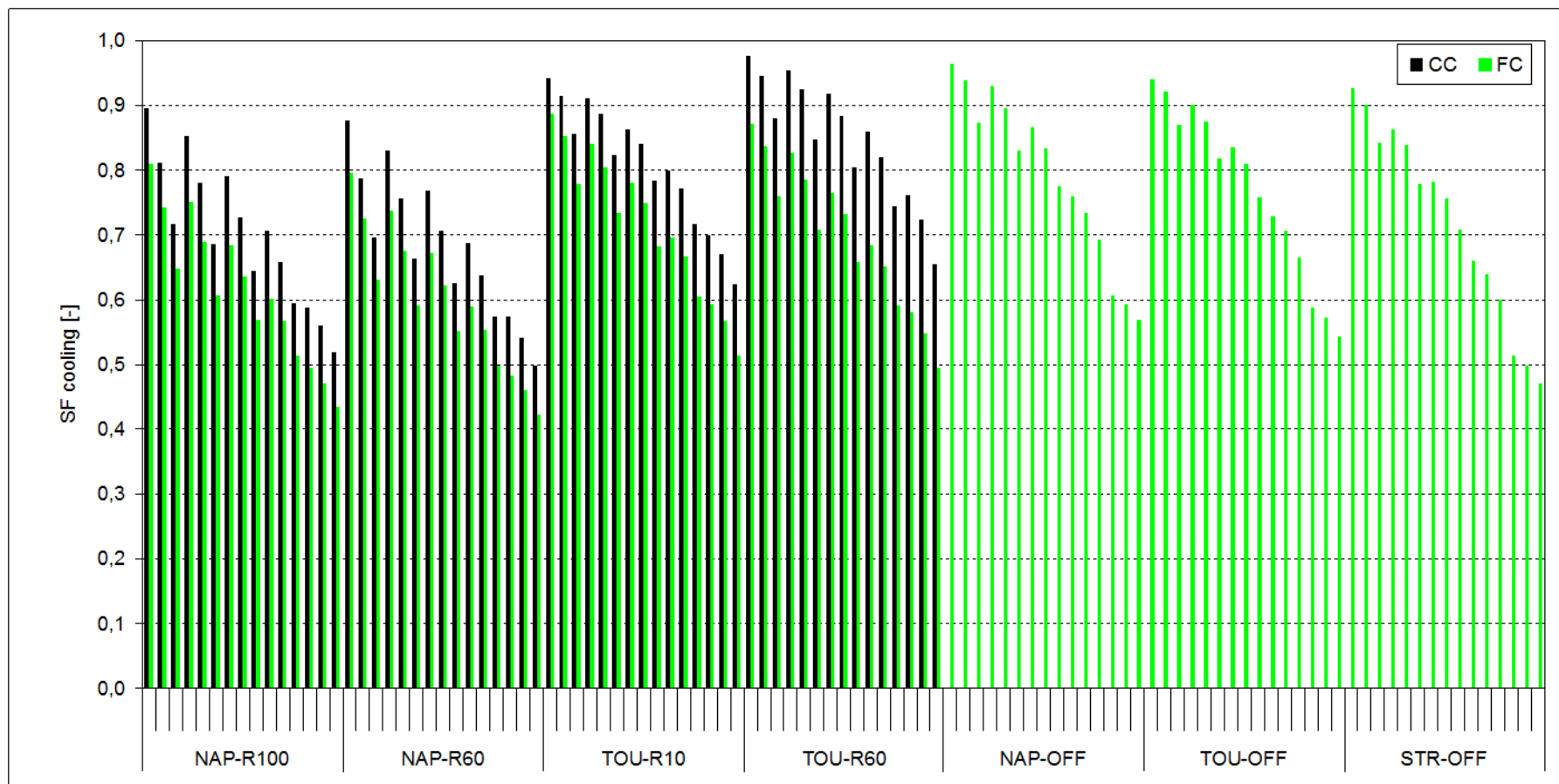
Pref: +31% (80=>90°C)

CC	
A_coll [m ²]	V_store [m ³]
88,5	6,7
88,5	4,5
88,5	2,2
75,5	5,7
75,5	3,8
75,5	1,9
62	4,7
62	3,1
62	1,6
49	3,7
49	2,5
49	1,3
35,5	2,7
35,5	1,8
35,5	0,9

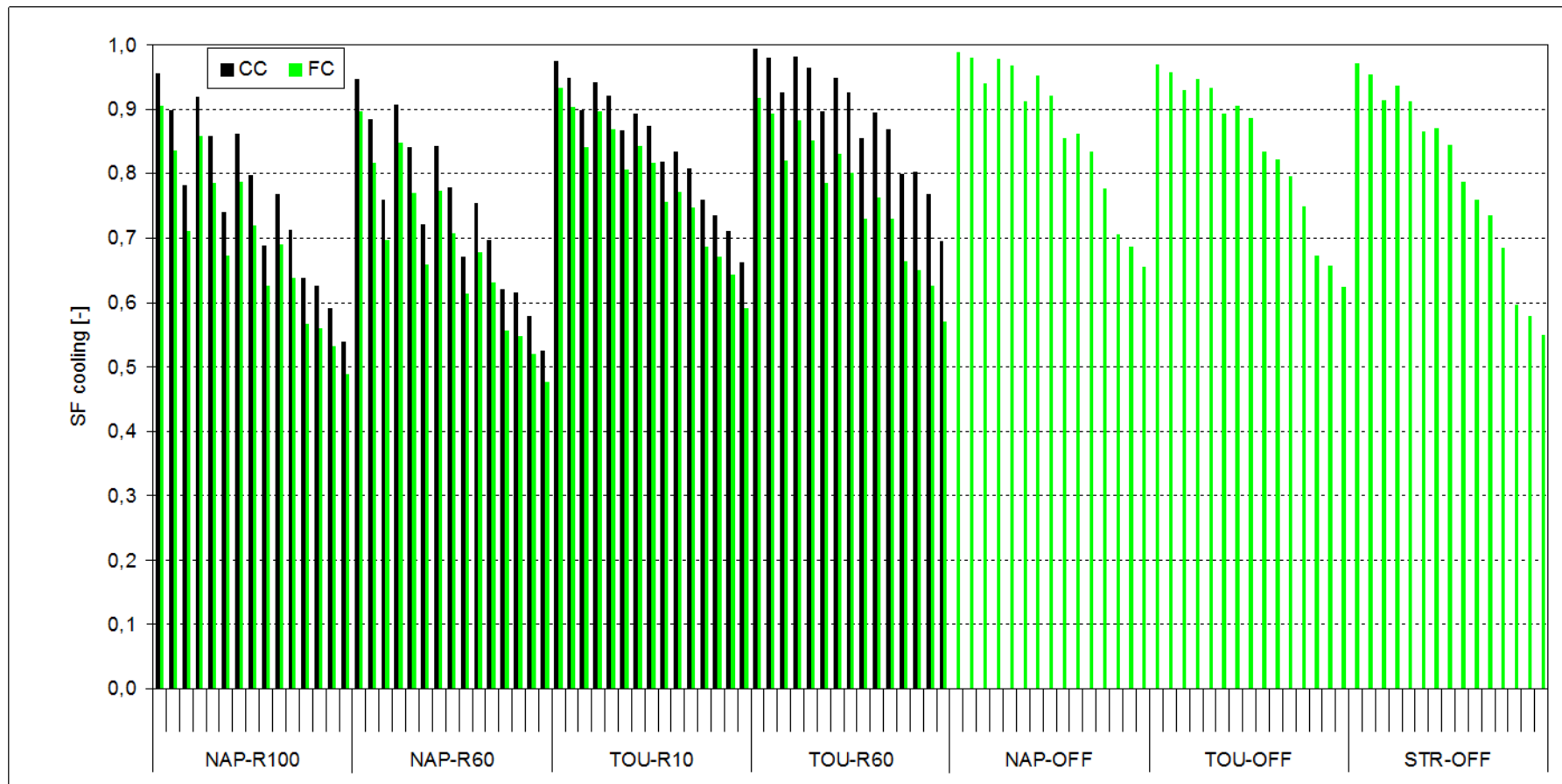
FC	
A_coll [m ²]	V_store [m ³]
69	5,2
69	3,5
69	1,8
59	4,5
59	3,0
59	1,5
48,5	3,7
48,5	2,4
48,5	1,2
38	2,9
38	1,9
38	1,0
27,5	2,0
27,5	1,4
27,5	0,7

no vacuum tubes; no dry cooling; V_store: 25,50,75 ltr/m²

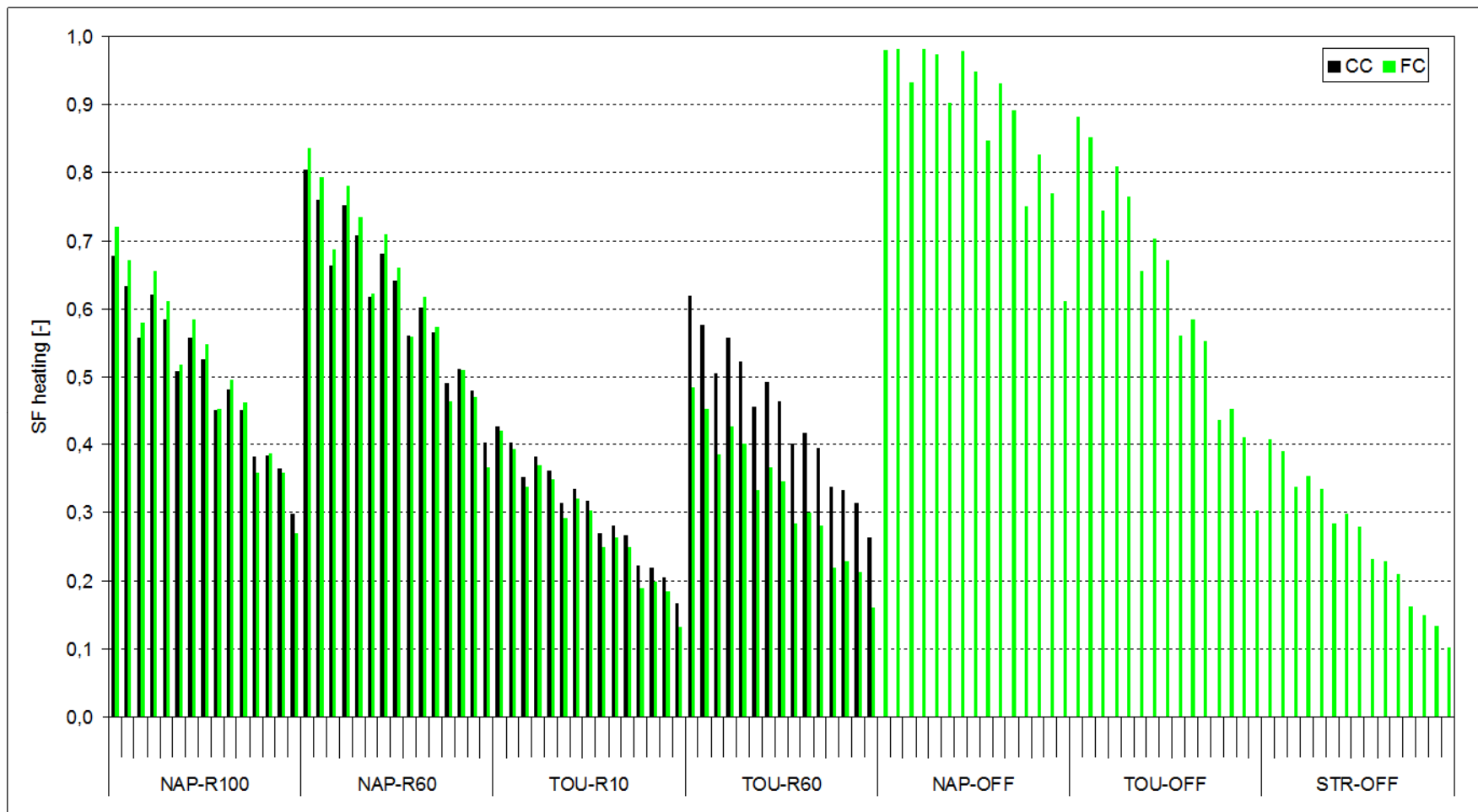
Solar Fraction – Cooling / CC and FC



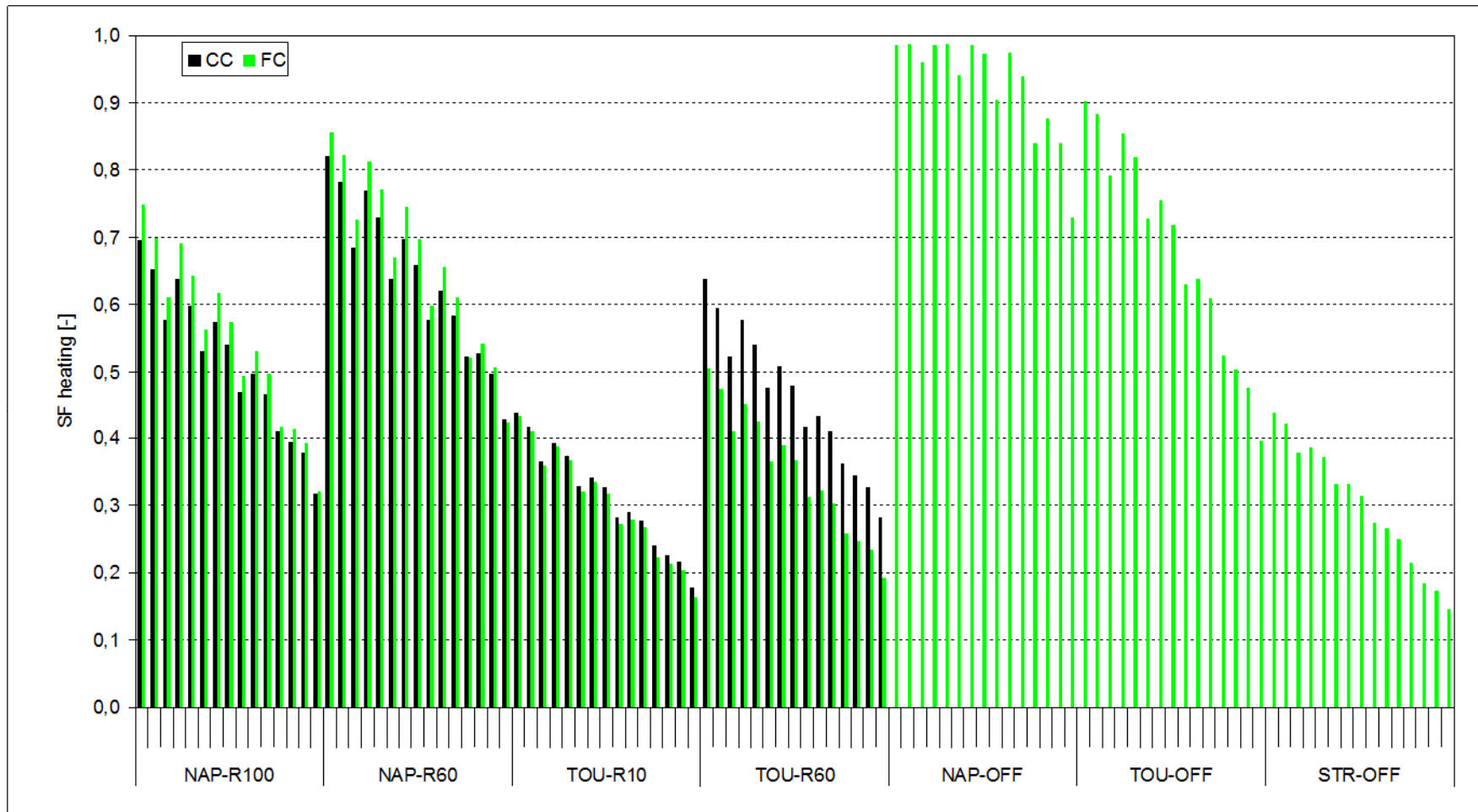
Solar Fraction – Cooling / CC and FC



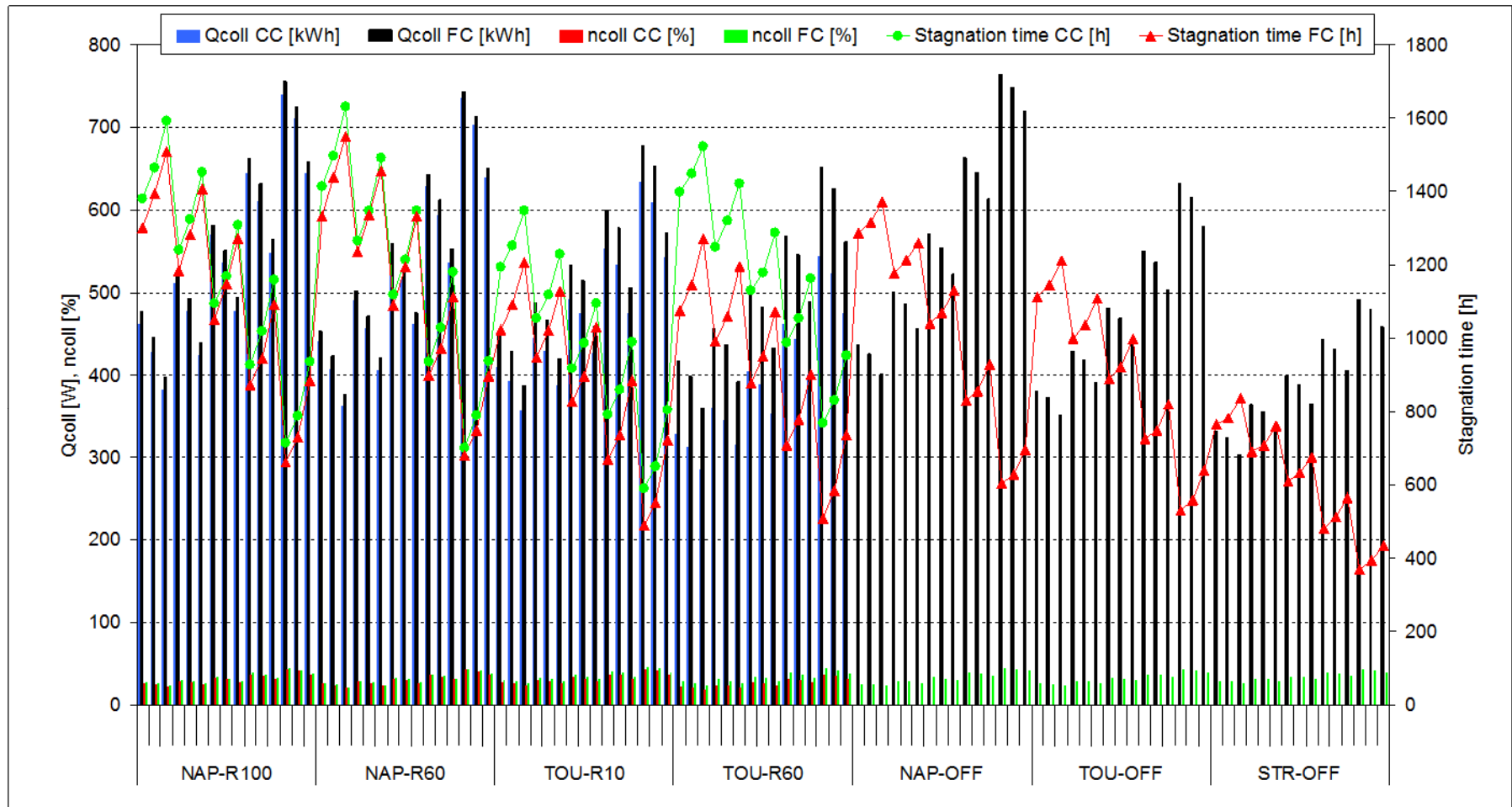
Solar Fraction – Heating / CC and FC



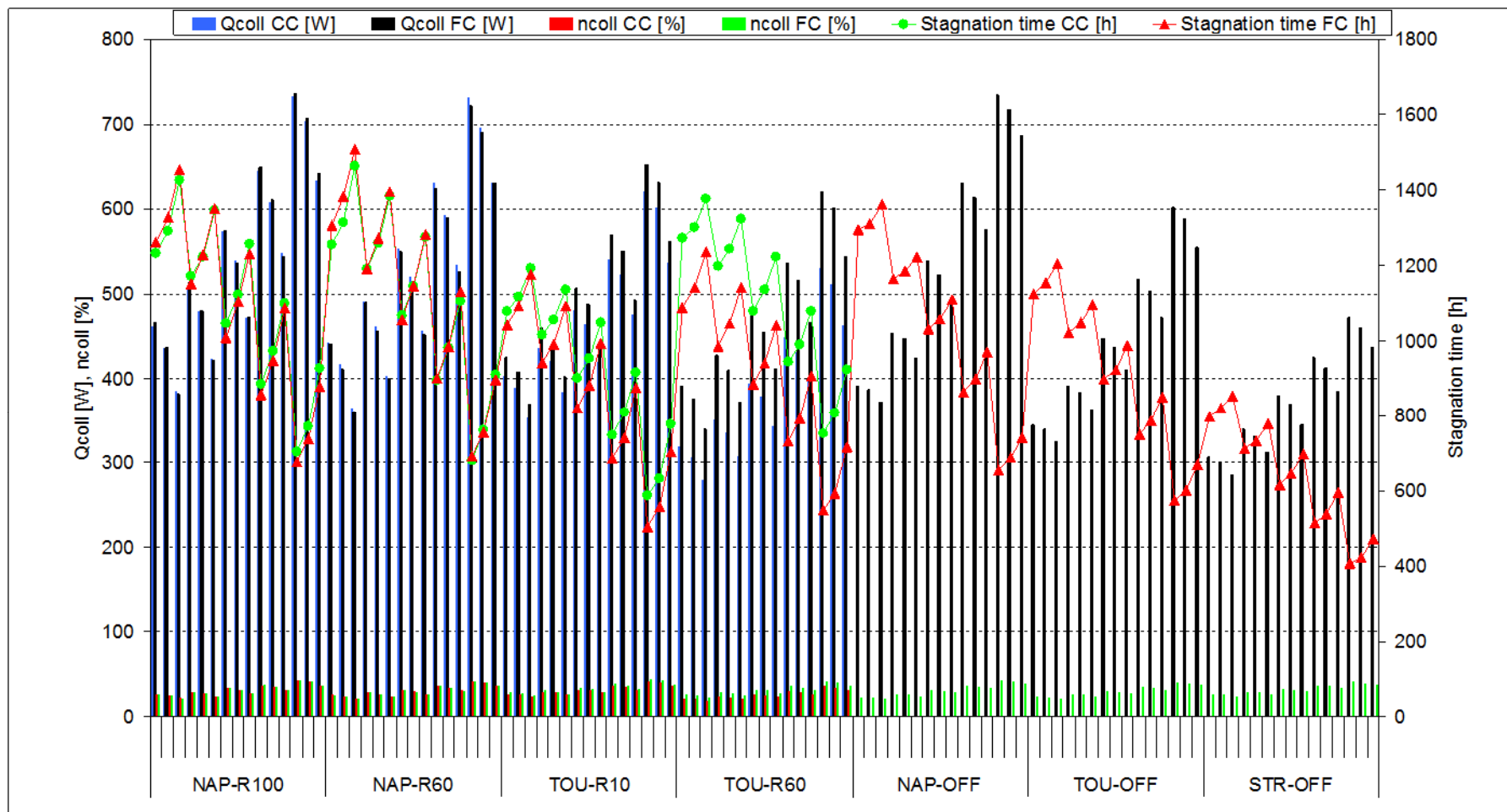
Solar Fraction – Heating / CC and FC



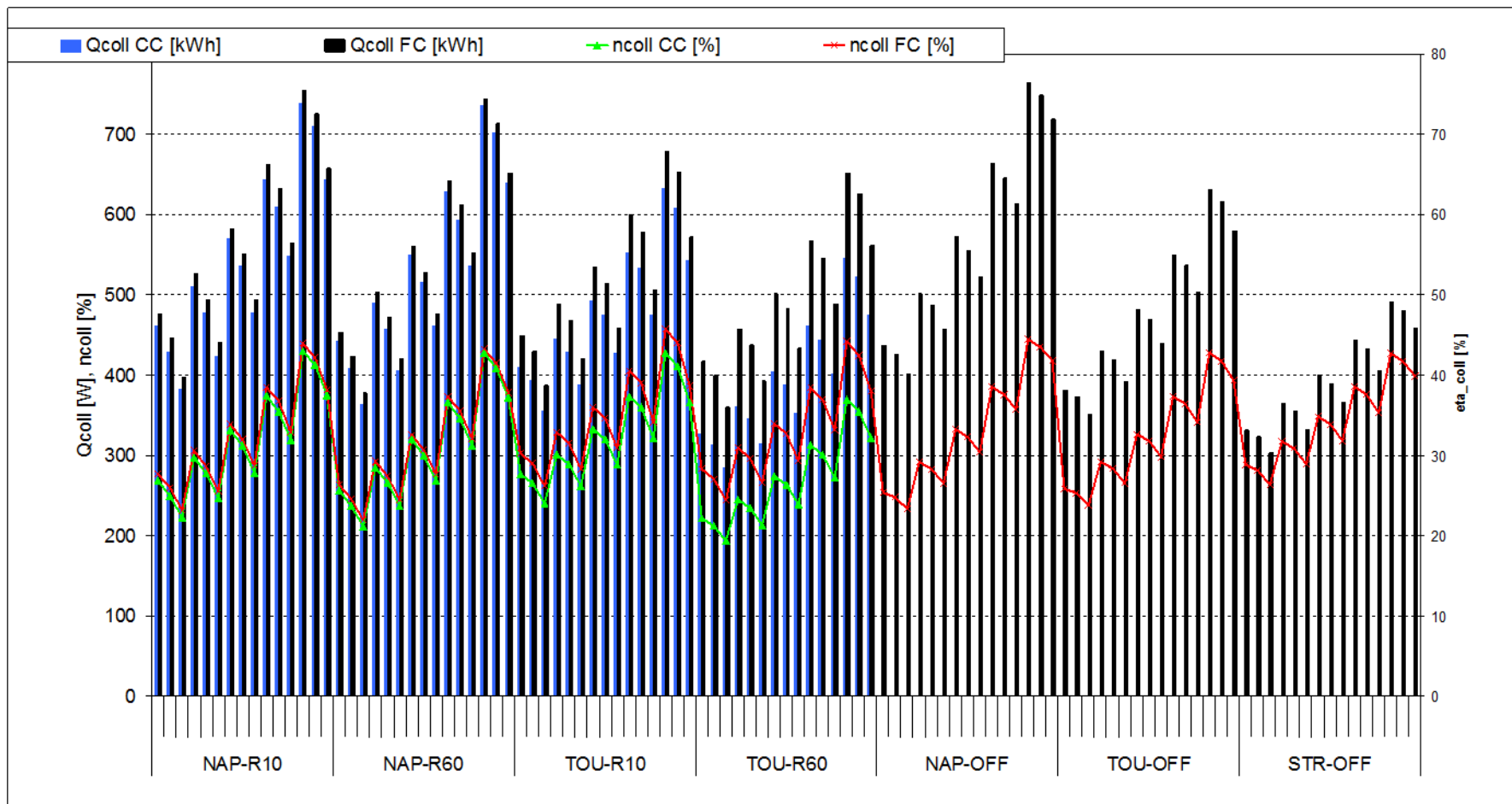
Solar Gain / Eta-Collector / Stagnation / CC and FC



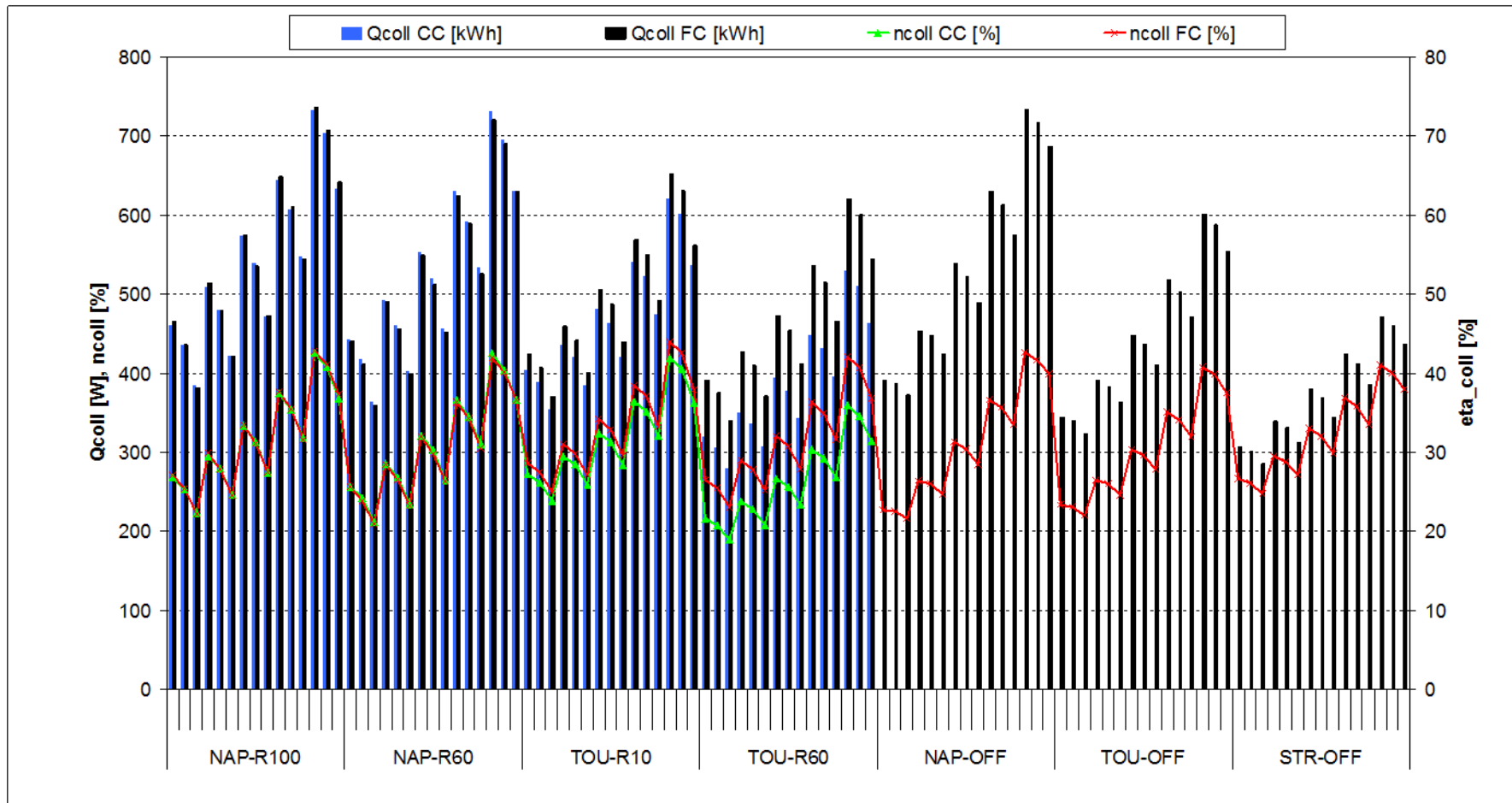
Solar Gain / Eta-Collector / Stagnation / CC and FC



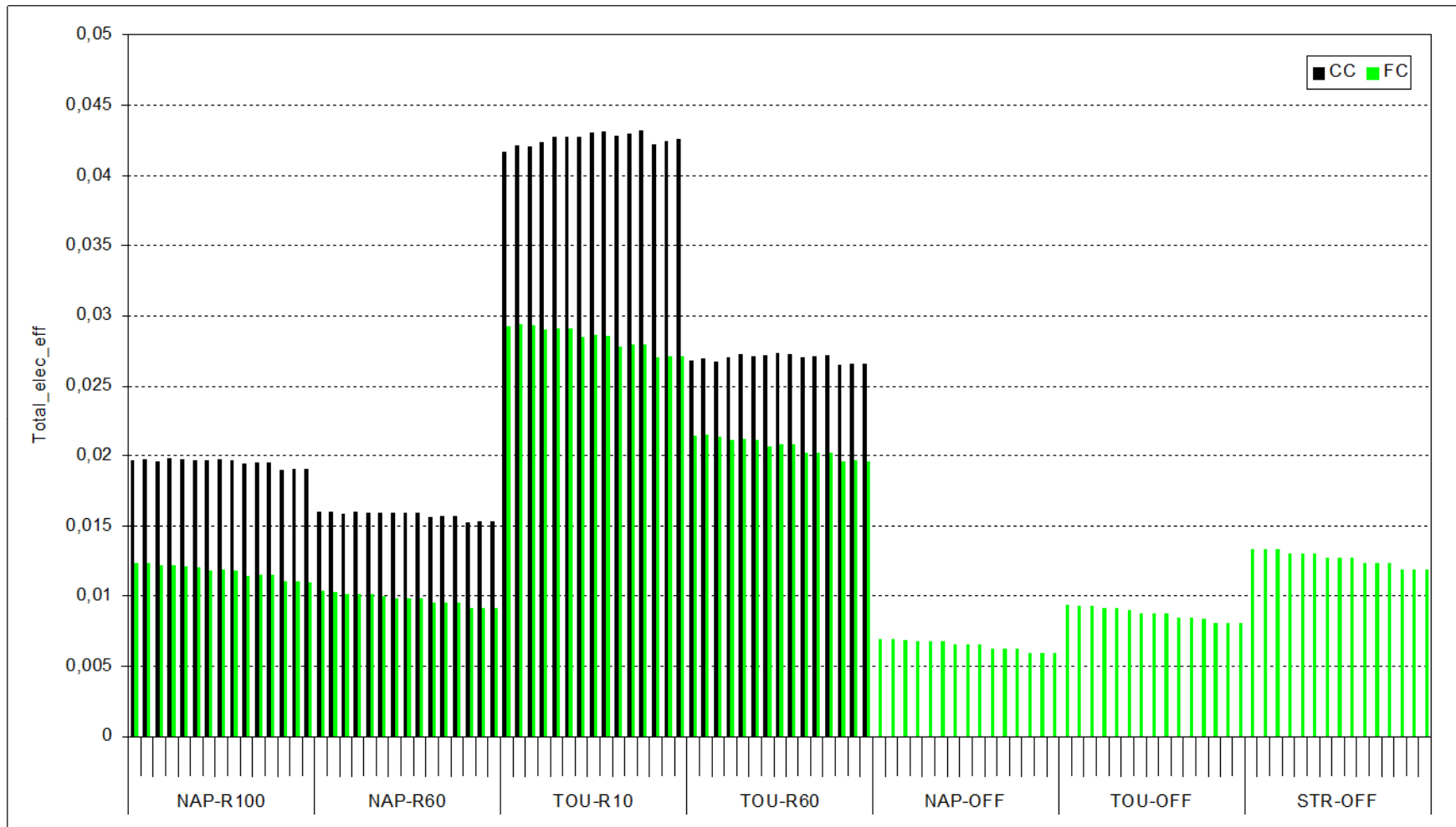
Solar Gain / Eta-Collector / CC and FC



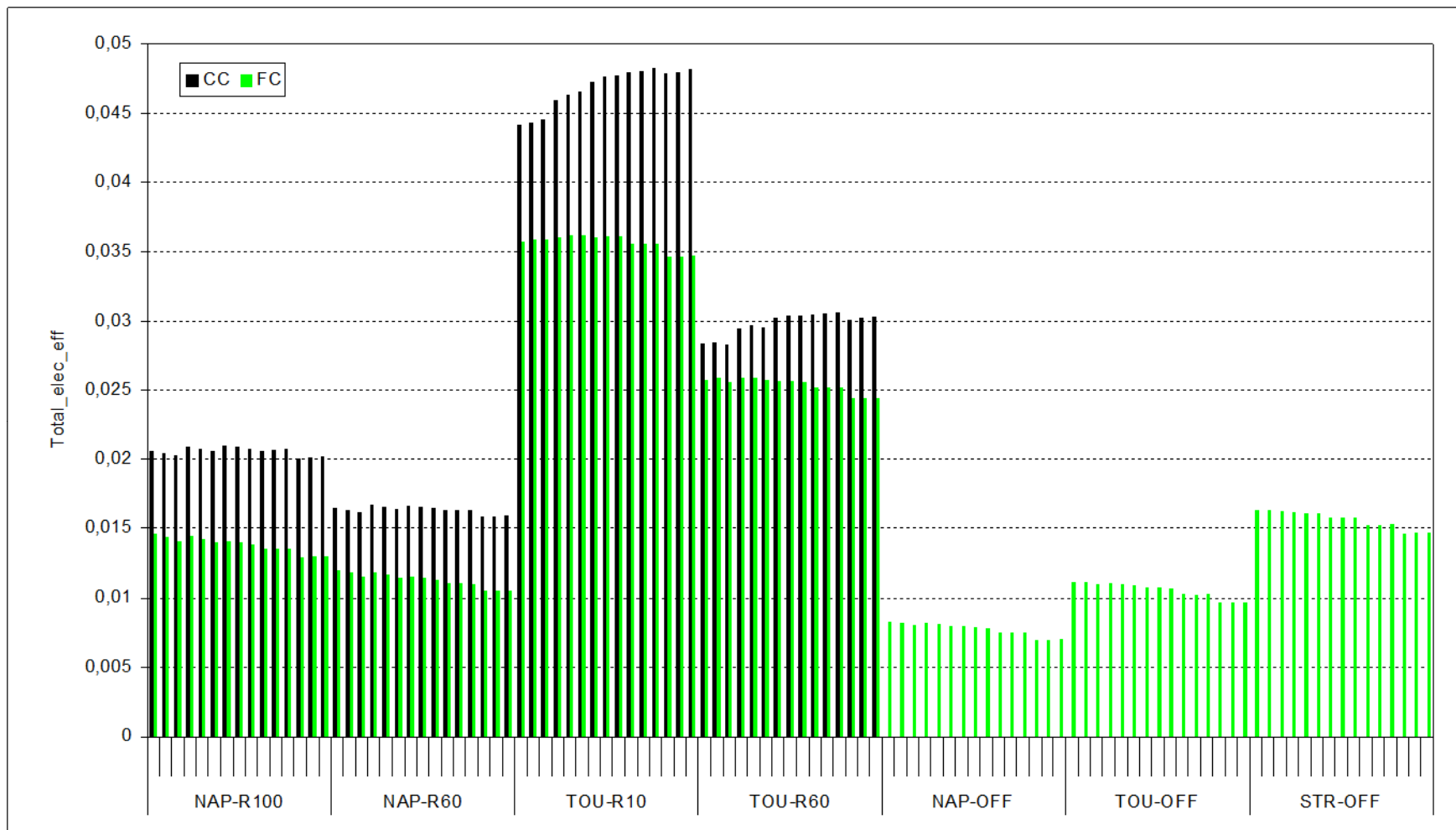
Solar Gain / Eta-Collector / CC and FC



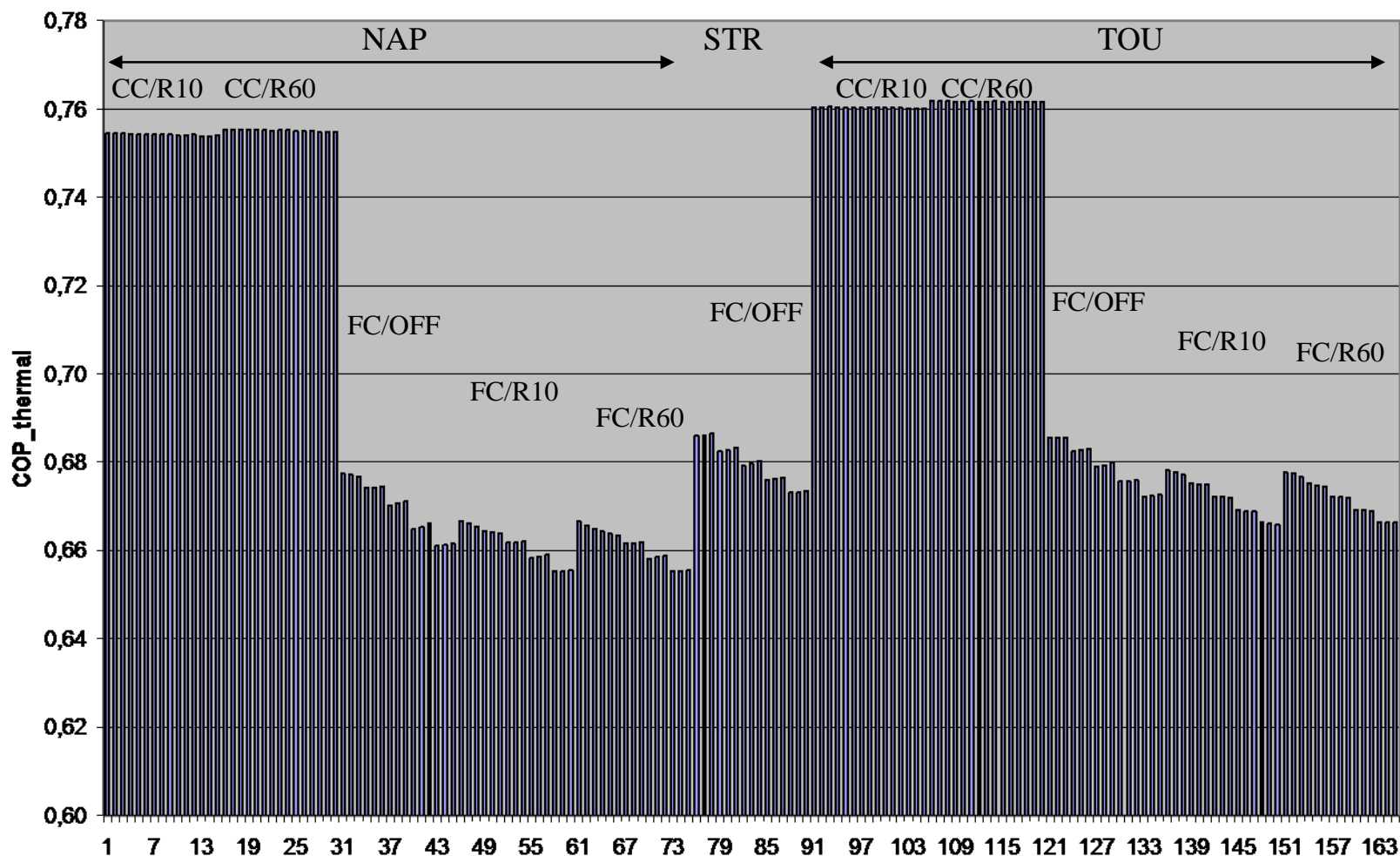
Total Electricity Efficiency / CC and FC



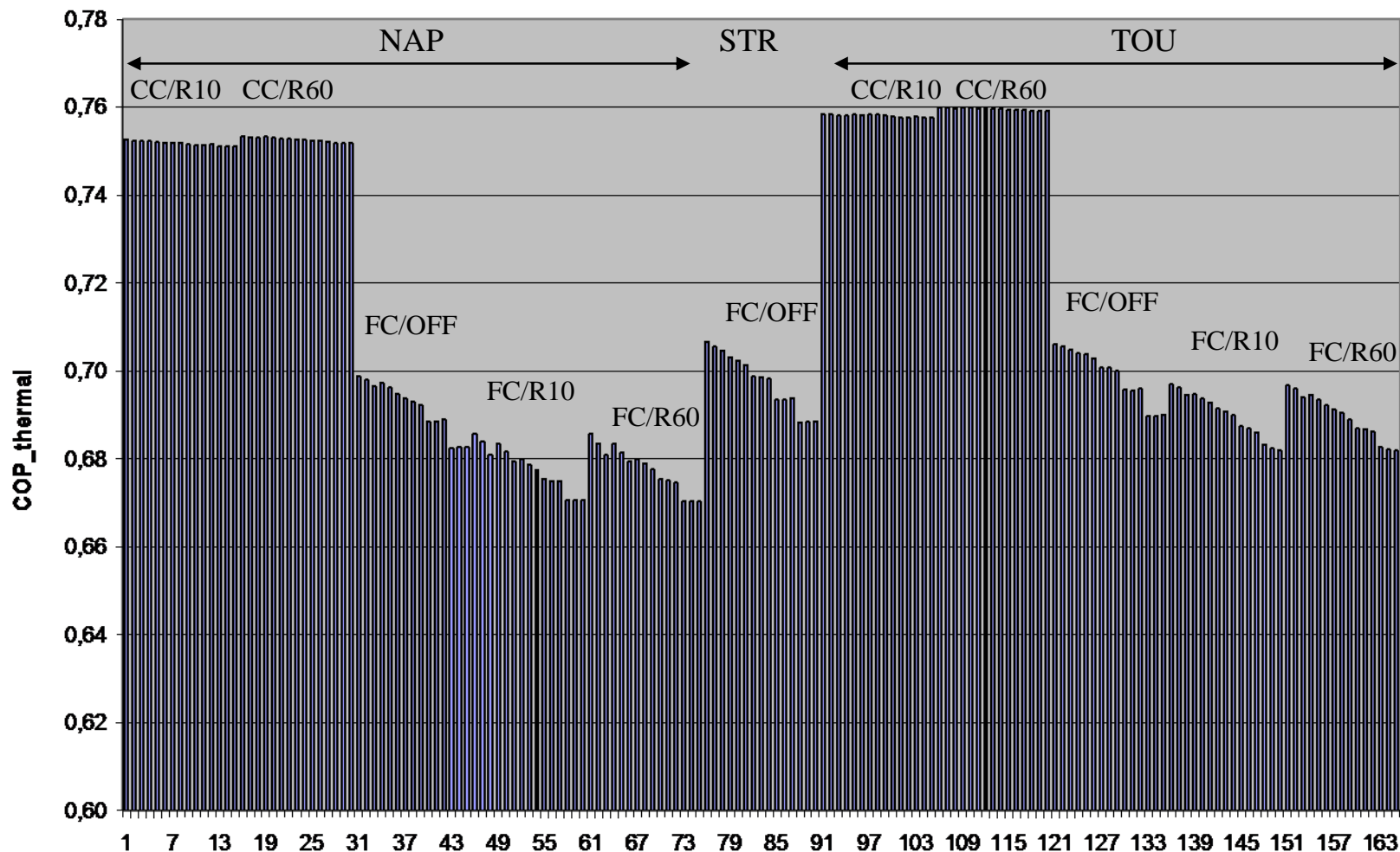
Total Electricity Efficiency / CC and FC



$COP_{thermal} / \text{large} \Rightarrow \text{small} / CC \Leftrightarrow FC ?!$



$COP_{thermal} / large \Rightarrow small / CC \Leftrightarrow FC ?!$



WP 3: Virtual Case Studies 1

Why R100 (instead of R10) in the Analysis Tool?

COP_{thermal} = quite high and constant for CC ??

COP_{thermal} = variable for FC !!

Minor influence of storage volume !?!



WP 3: Virtual Case Studies 2

COP_{thermal} = quite high and constant for CC,
but slightly lower than in run 1

COP_{thermal} = again variable for FC !! significant higher !!

„Freezing“ Hot tank ☺ due to too low auxiliary power

Storage Control – chiller start: bad positioning of T sensor,
Which was sometimes (depending on volume) below
auxiliary volume (=200ltr) => No chiller start ! =>
T-Sensor now in middle of Aux-Volume

Electricity consumption of cold storage pump not included in
graphs!! But integrated in Analysis excel file !! I hope
correct!?!