Results of EuP Lot 11: Pumps and Circulators

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Motor Summit 2008
Zurich, 25 November 2008

Plan Design Enable

Definition of scope and exclusions

Clean water duty only

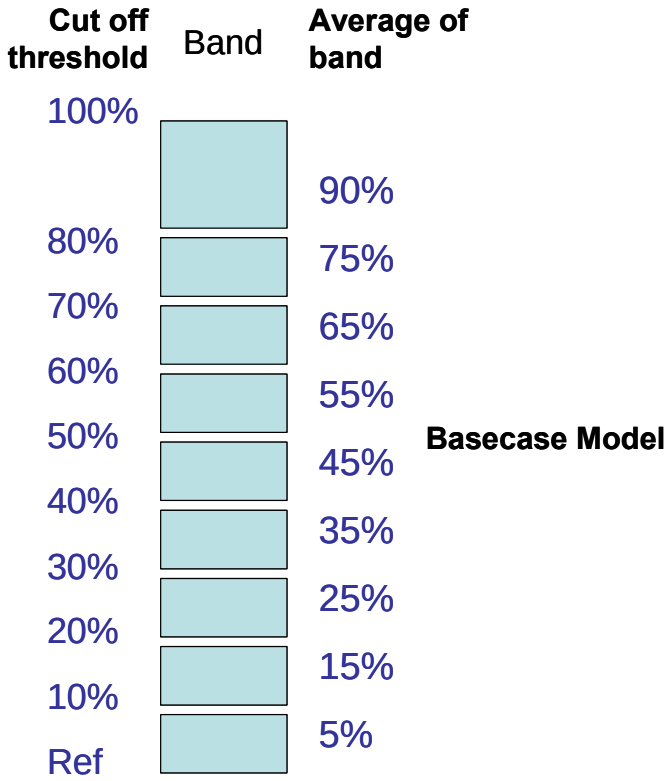
- End suction water pumps (ESOB, ESCC, ESCCi)

- Vertical multistage water pumps

- Submersible multistage pumps

Pumps with special features excluded

Basis of method – mean efficiency of each decile

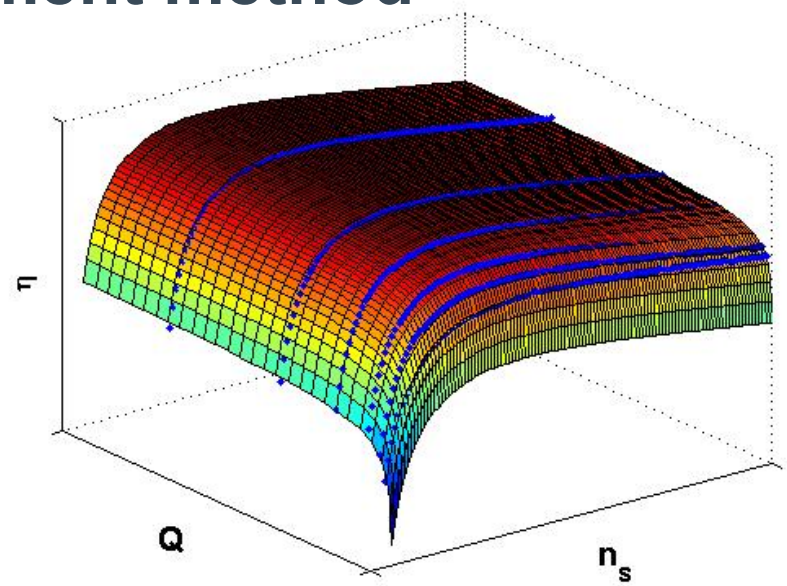


Results

- LLCC level around C=70/80% depending on pump category, corresponding to some 6,5 TWh savings
- Claimed cost for industry 400 MEUR – staged introduction of requirements is proposed to give time to adapt
- Expected savings from proposed measures = 3,4 TWh by 2020 but savings continuous = life-time of a pump is 11 years
- No labelling proposed as largely OEM market: ‘best of class’ (C=80%) indication for benchmark level
- World in move: voluntary certification pump efficiency scheme in Korea + mandatory national efficiency standard in China

Pumps efficiency assessment method

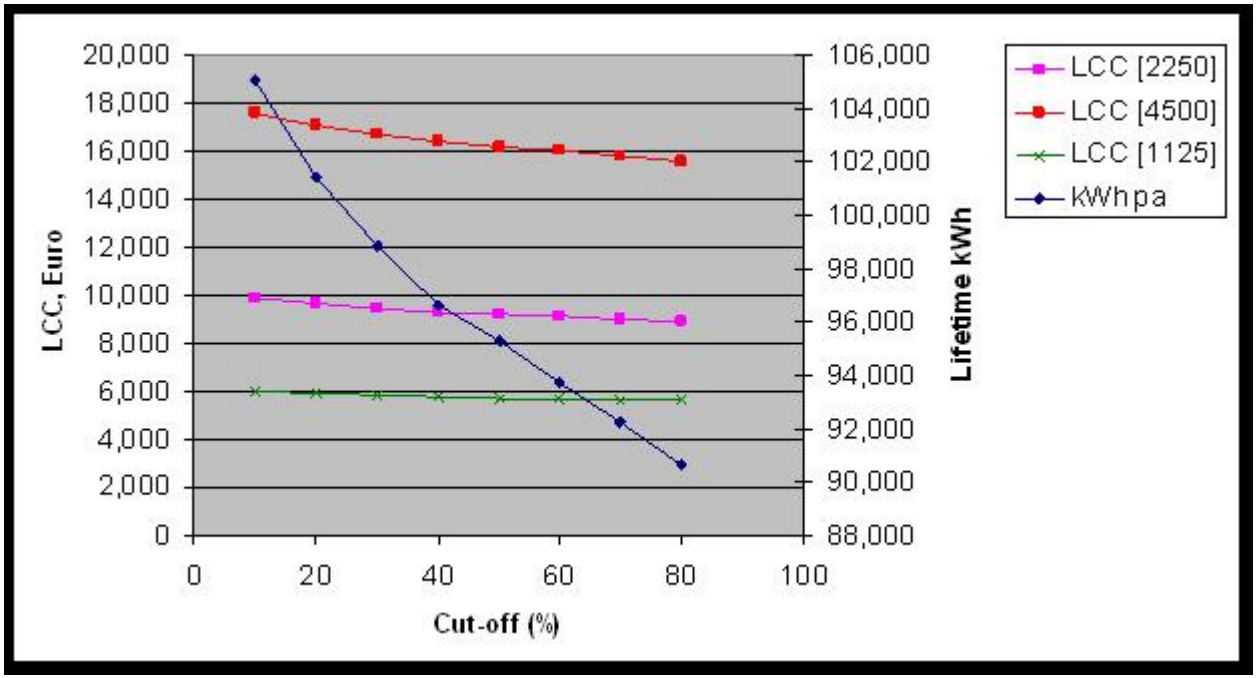
- 1. no pump efficiency assessment method available
- 2. preparatory study made pioneering work: workable solution
- 3. need to see requirements in long-term context (revision)



	Quantity cut-off									
	5%	10%	15%	20%	30%	40%	50%	60%	70%	80%
C (ESOB 1450)	134.38	132.58	131.70	130.68	129.35	128.07	126.97	126.10	124.85	122.94
C (ESOB 2900)	137.28	135.60	134.54	133.43	131.61	130.27	129.18	128.12	127.06	125.34
C (ESCC 1450)	134.39	132.74	132.07	131.20	129.77	128.46	127.38	126.57	125.46	124.07
C (ESCC 2900)	137.32	135.93	134.86	133.82	132.23	130.77	129.86	128.80	127.75	126.54
C (ESCCI 1450)	138.13	136.67	135.40	134.60	133.44	132.30	131.00	130.32	128.98	127.30
C (ESCCI 2900)	141.71	139.45	137.73	136.53	134.91	133.69	132.65	131.34	129.83	128.14
C (MS 1450)	134.83	134.45	133.89	132.97	132.40	130.38	130.04	127.22	125.48	123.93
C (MS 2900)	139.52	138.19	136.95	135.41	134.89	133.95	133.43	131.87	130.37	127.75
C (MSS 2900)	137.08	134.31	132.89	132.43	130.94	128.79	127.27	125.22	123.84	122.05

$$\eta_{BOT} = -11.48\,x^2 - 0.85\,y^2 - 0.38\,xy + 88.59\,x + 13.46\,y - C$$

Sample LCC analysis



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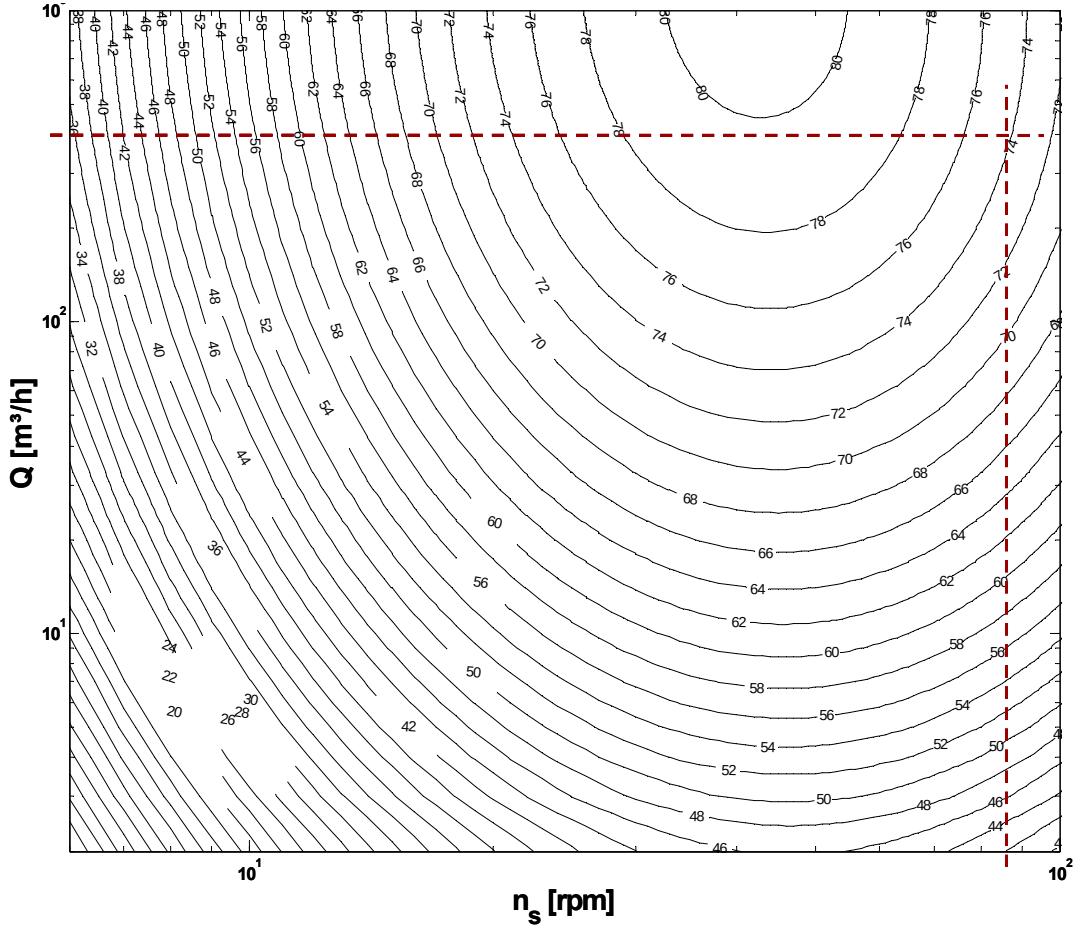
Anticipated realisation of the scheme



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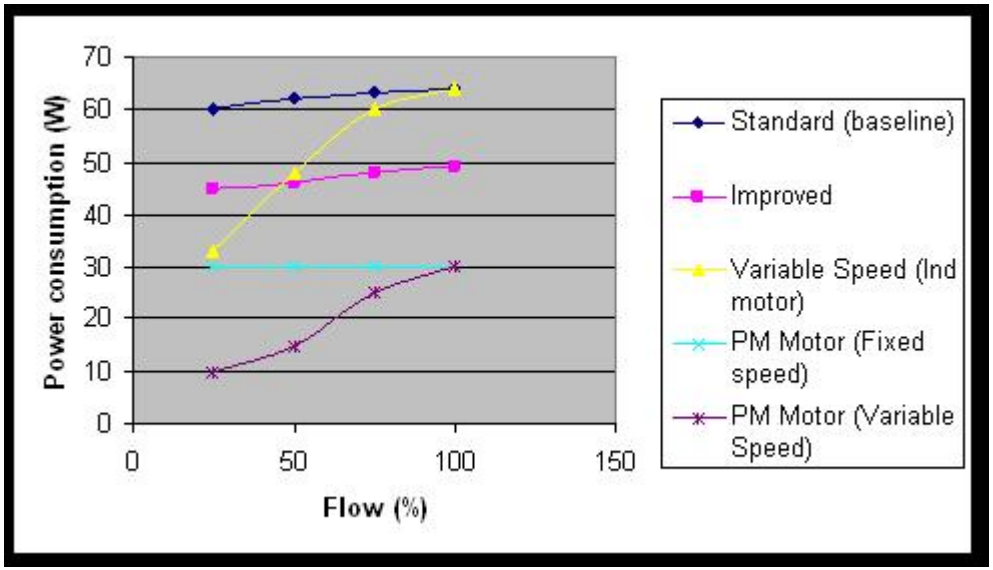
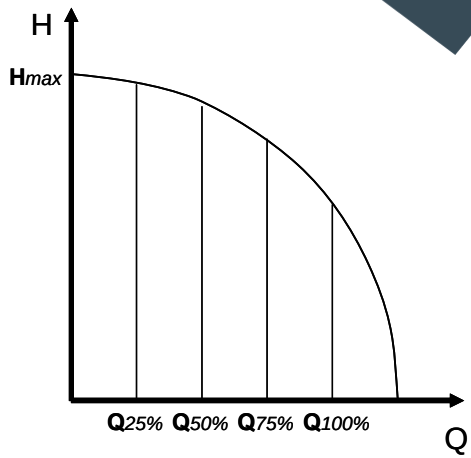
Circulators

Methodology



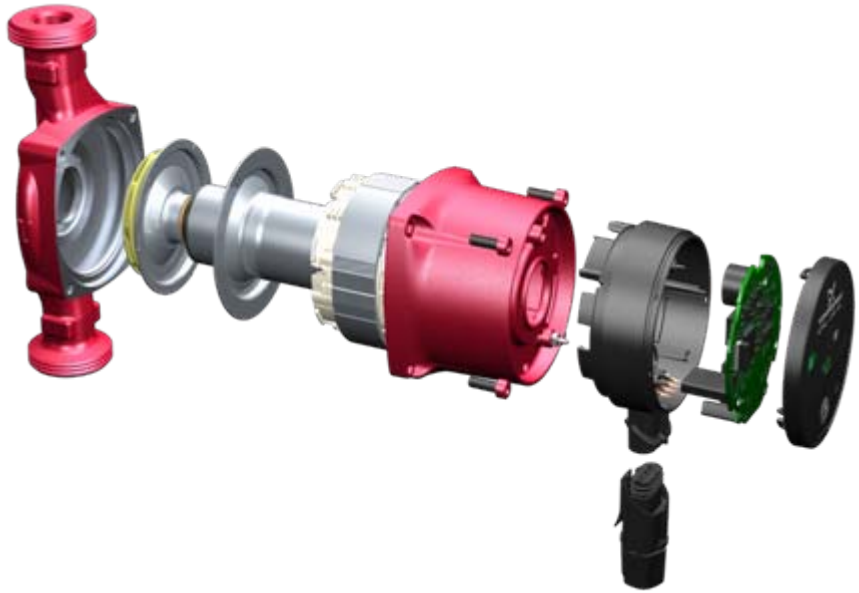


Flow (%)	Time (%)
100	6
75	15
50	35
25	44

Control option	Annual running hours	Flow profile
Continuous	5,000	Blauer Engel
On/Off Thermostatic Radiator Valve (TRV) control	2,300	Blauer Engel
On/Off control	2,300	100% or OFF

Costs of improved technology

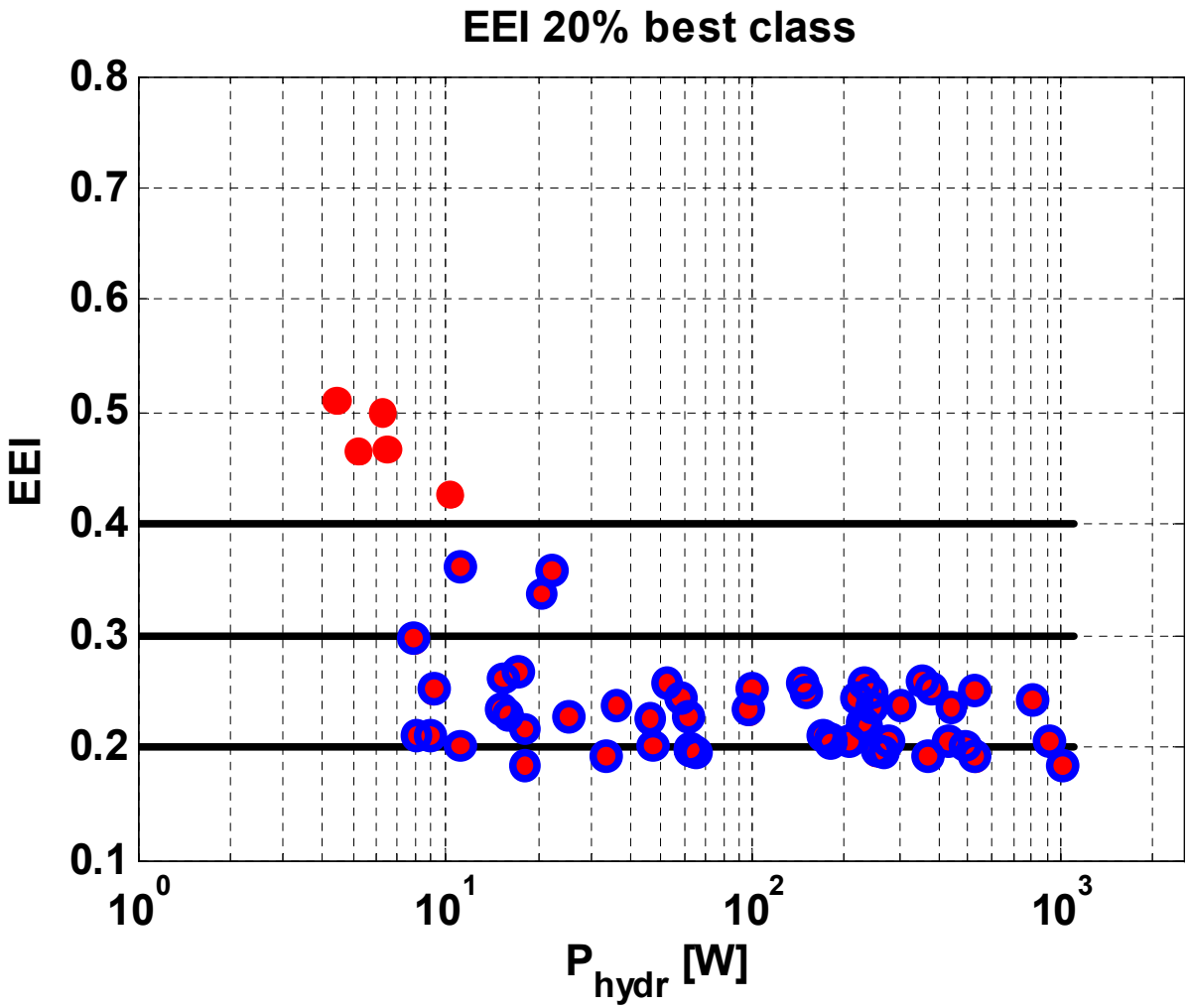
Ref	Design Option	Cost (%)	Cost (Euros)	Additional Cost (Euros)
1	Baseline	100	120	0
2	Speed Control (induction motor)	135	162	42
3	PM/Variable speed	200	240	120
4	Improved design – conventional technology	120	144	24



Changes since the Consultation Forum

- Boiler Integrated circulators also to be included
- Re-alignment of EEI scheme to make MEPS equally challenging for both small and large circulators

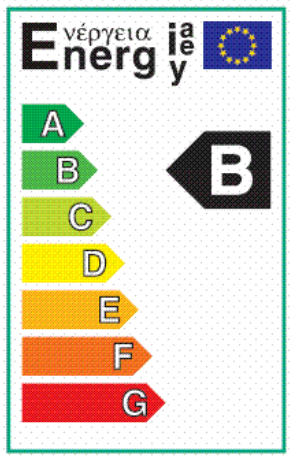
Efficiencies of existing circulators



$$EEI = \frac{P_{avg}}{P_{ref}} \cdot C$$

C = 0.49

New efficiency levels



Now

The future…..

Class	Energy Efficiency Index (EEI)
A	EEI < 0.40
B	0.40 = EEI < 0.60
C	0.60 = EEI < 0.80
D	0.80 = EEI < 1.00
E	1.00 = EEI < 1.20
F	1.20 = EEI < 1.40
G	EEI =1.40

Class	Energy Efficiency Index (EEI)
A*	EEI < 0.20
A	0.20 = EEI < 0.40

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www.ecomotors.org