

Strategic Role

Rehabilitation & Modernisation

Electric Power Supply

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Rehabilitation & Modernisation

is the **decisive key** for a

economic, social and environmental viable

Electric Power Supply

Examples

for

Rehabilitation & Modernisation

'best practise' and state of the art management methods

'best practise'

→ Efficiency Increase

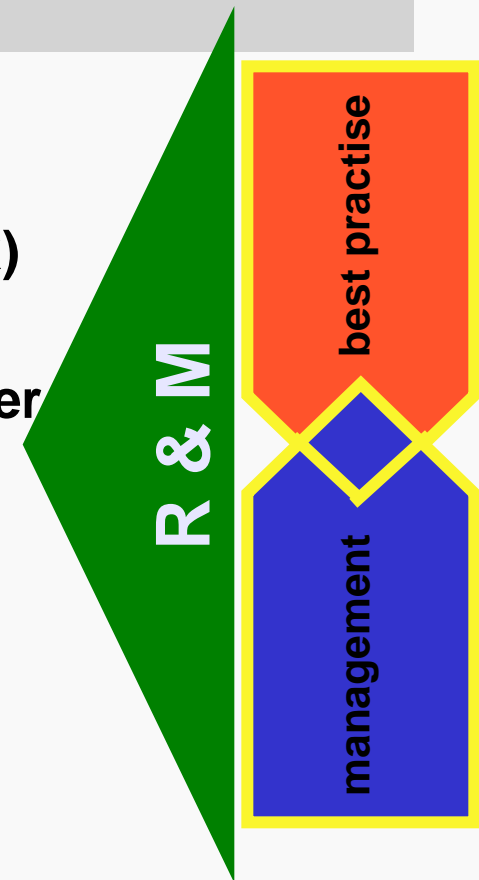
- PP Jänschwalde $\Delta P = 6\%$ resp 4% (DeSOx)
- PP Hayden $\Delta P = 2\%$ boiler only
- PP Heilbronn $\Delta P = 10\%$ + increase power

'management methods'

→ increased Reliability

- forced outage 'fossil' $R = 5,5\%^*$
- forced outage 'hard coal' sc $R = 6,5\%^*$
- forced outage 'lignite' $R = 5,0\%^*$

* 10 year average



Rehabilitation & Modernisation for countries like INDIA

 ***urgent Need for Action***

in order to cope with the Challenge of

- **Demand (Increase)**
- **Financial Resources**
- **Social Viability**

R & M is the Pre-requisite for Success

Rehabilitation & Modernisation

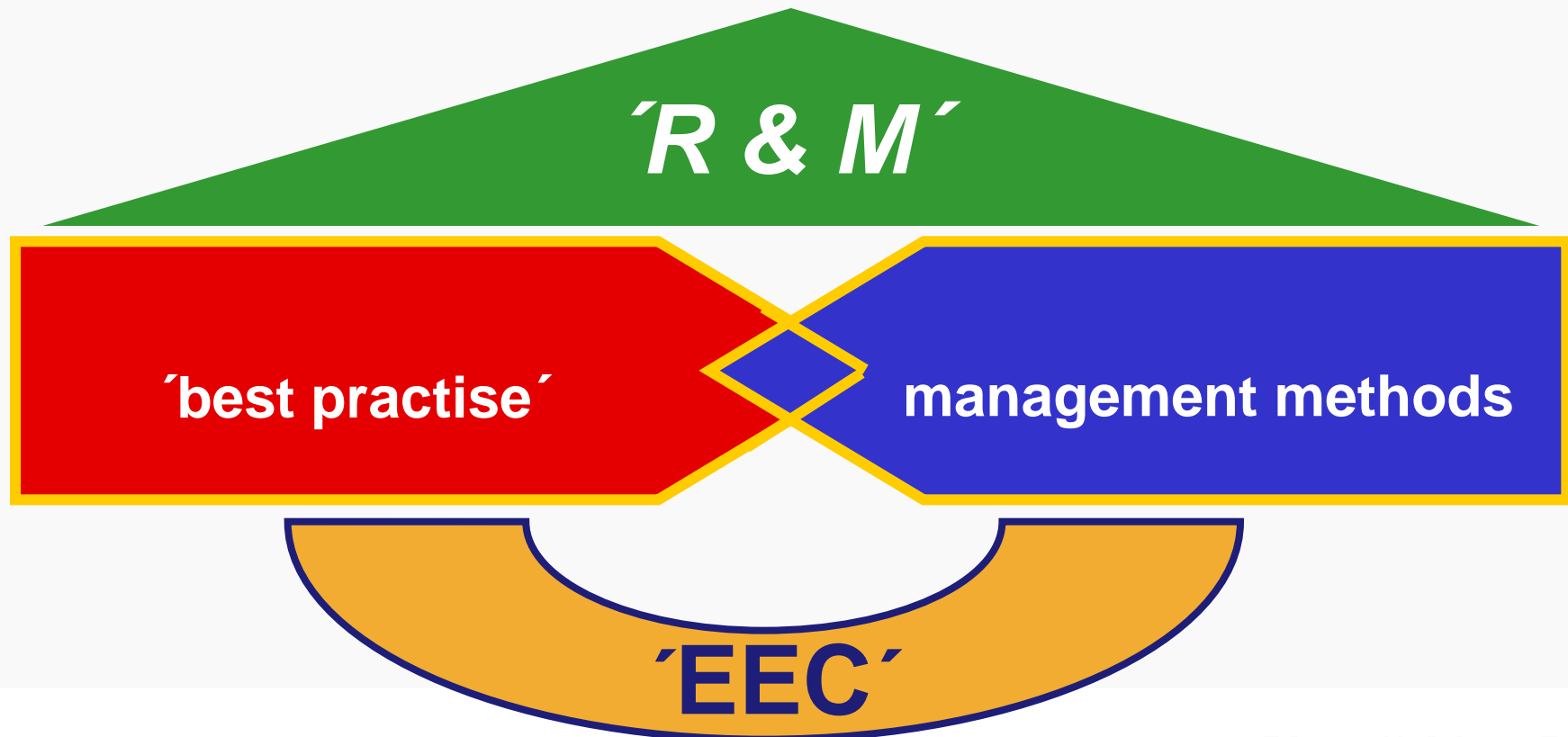
can provide

Improvement of

- 
- electric Output
 - Efficiency
 - Reliability and
 - Opportunity for
 - raising Awareness and
 - 'test rig' for new Plants

Basics of Rehabilitation & Modernisation

- **best practise** in terms of applied technologies
- *state of the art* **management methods**



Rehabilitation & Modernisation

social Viability ↔ *financial Resources*



**Investments needed to finance Plants →
requesting Tariffs to cover the Cost and
Tariffs have to be affordable!**

Rehabilitation & Modernisation

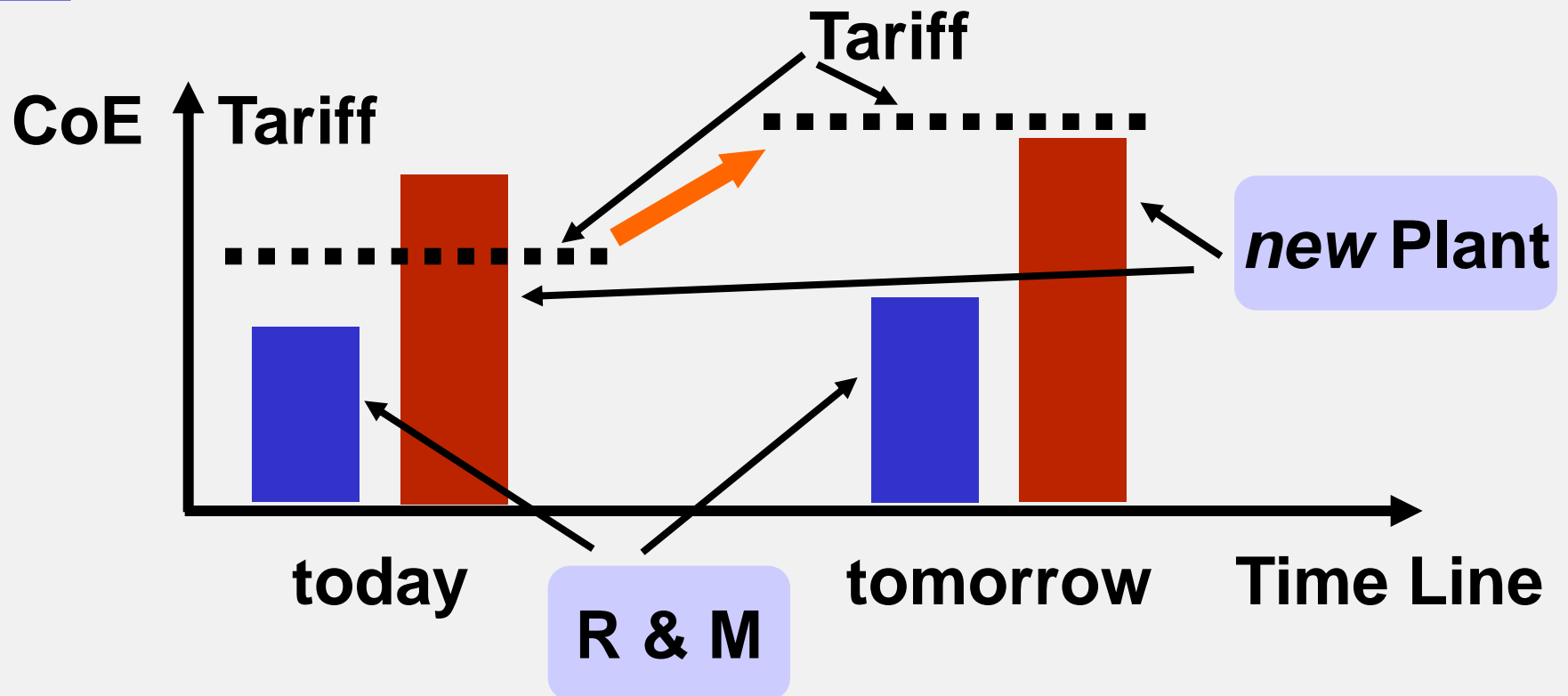
...on order to achieve **positive Cash Flow**
focussed on the generation cost only

	R & M	<i>new Plant</i>
	15 - 20 €/MWh	36 - 42 €/MWh
	6 - 9 %	15 - 20 % avg. Income*)

*) based on IEA Outlook

Rehabilitation & Modernisation

➤ Tariffs are of social & economic Relevance



Summary

➤ *there are decisive Opportunities in*

 **Rehabilitation & Modernisation of existing
Erection of *state of the art* new Plants**

➤ **there is Need of Recognition
of Limitations in
Funding, Time and Learning**

Key to Success !



Thank you for your Attention

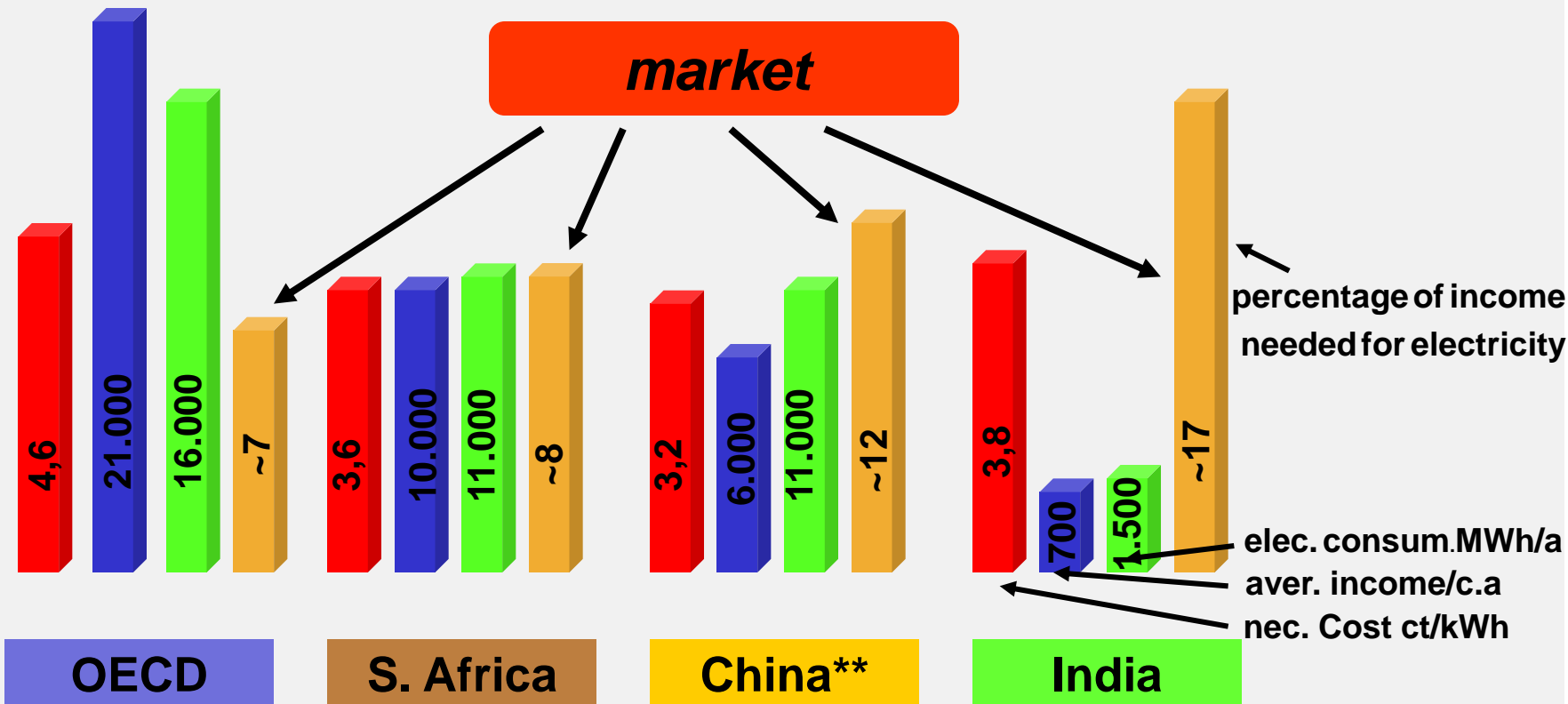
Modernisation – an Opportunity for efficiency Increase

System	previous	boiler	turbine	cooling	De-SOx	new
Heat Consumption Turbine kJ/kWh	8705/8930	-	-360/460	-44	-	8370/8490
Boiler Efficiency %	84,0/85,0	+4,2/5,8	-	-	-	89,1/90,2
Auxiliary Consumption %	5,2	-	-	-	+2	7,2
Unit Efficiency, net %	31,0/32,0	+1,5/2,2	+1,5/1,9	+0,2	-0,7	35,5/36,1

Efficiency Increase of the B 500 MW_{el} Units
nominal load

Comparison – Correlation

electricity consumption (MWh/c.a), average income per capita and year (€/a)
 'necessary cost' * for electricity (ct/kWh) and percentage of income



* cost needed in order to achieve a positive cash flow at domestic condition

** 'coast strip'

Affordability of Clean Coal Technologies

Comparison: Cost of Electricity as Percentage of Average Income

	OECD	S. Africa	China	India	Basis
Investment Coal €/t	650 Mio. 60 €/t	650 Mio 20 €/t	500 Mio 20 €/t	575 Mio 20 €/t	P * 500 MW _{el} η* = 46%
efph CoE	7500/6500 h 4,6/5,0	6600/6200 h 4,0/3,5	6400/5600 h 3,2/3,5	6500/5500 h 4,0/3,5	needed for positive cash
GJ/cap.a	180	120	140	15	consumption
€/cap.a	21.000	10.000	6.000 - 300	750 - 200	average Income
	7 → 5%	8 - 6%	12 - 80%	17 - 100%	percentage of avg. Income
	without Industrie	without Industrie	with Industrie coastal	big centres rural	rural