



ENERGY CONSUMPTION NORMS FOR CEMENT SECTOR UNDER ENERGY CONSERVATION ACT - 2001

METHODOLOGY ADOPTED

- ❖ **SETTING UP OF A TECHNICAL COMMITTEE CONSISTING OF REPRESENTATIVES OF CEMENT INDUSTRY, NCB, CEMENT MANUFACTURERS' ASSOCIATION (CMA), GOVT. DEPTT., CONSULTANTS BY BUREAU OF ENERGY EFFICIENCY (BEE) FOR GUIDANCE**
- ❖ **CMA/CEMENT INDUSTRY REPS' ACTIVELY ASSOCIATED WITH THE TASK**
- ❖ **REGULAR INTERACTIONS BY TECHNICAL COMMITTEE AND BEE**

DEVELOPMENT OF ENERGY CONSUMPTION NORMS FOR CEMENT PLANTS



PRESENT STATUS

- ❖ **Draft Energy Consumption Norms in four alternative options presented by NCB, in consultation with CMA/Industry, during 4th Cement Sector Task Force meeting of BEE held on 17 Oct'06 at Delhi and deliberated in detail.**
- ❖ **Draft Energy Consumption Norms including voluntary reduction proposal discussed and finalised in Technical Committee Meeting of CMA on 19 December 2006 at Delhi, as decided in BEE Task Force meeting.**
- ❖ **CMA submitted the proposed Norms and Voluntary reduction targets for different categories to BEE on 09 January 2007.**
- ❖ **A meeting held at BEE, attended by CMA/Industry and NCB, on 13 April 2007 for discussion on the proposed norms submitted by CMA**

PROPOSED ENERGY CONSUMPTION NORMS BY CMA

THERMAL ENERGY (Kcal/kgcl measured as NCV)

System	Proposed Norms
❖ Wet Process	≤ 1400
❖ Semi-Dry Process	≤ 1000
❖ Dry Process, kiln ≤ 1000 tpd	≤ 875
❖ Dry Process, kiln 1000 to 2000 tpd Capacity	≤ 875

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PROPOSED ENERGY CONSUMPTION NORMS BY CMA

THERMAL ENERGY (Kcal/kgcl measured as NCV)

System

Proposed Norms

- ❖ Kiln with 2000 to 3500 tpd Capacity on Commissioning :
 - Plants Commissioned before 1989 ≤ 850
 - Plants Commissioned after 1989, or old plants with major modification after 1989 – initial capacity less than 3500 tpd. ≤ 820
- ❖ Kiln above 3500 tpd Capacity :
 - Commissioned pre 2000 ≤ 800
 - Commissioned post 2000 ≤ 770

All capacities mean original installed capacity

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PROPOSED ENERGY CONSUMPTION NORMS BY CMA

POWER CONSUMPTION (kWh/t Cement)

System

Proposed Norms

❖ Integrated Plants

- | | |
|------------|-------|
| ➤ OPC – 43 | ≤ 110 |
| ➤ OPC – 53 | ≤ 112 |
| ➤ PPC | ≤ 100 |
| ➤ PSC | ≤ 108 |

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PROPOSED ENERGY CONSUMPTION NORMS BY CMA

POWER CONSUMPTION (kWh/t Cement)

System

Proposed Norms

❖ Grinding Unit

- OPC – 43
- OPC – 53
- PPC
- PSC

No Separate Norms for Grinding units. Power consumption be linked to that of the sourced clinker. The power consumption for Grinding units be computed on power consumption upto clinkerisation of the mother unit (Clinker source) plus value for cement grinding and be equated with the integrated plant.

PROPOSAL FOR VOLUNTARY REDUCTION FOR POWER CONSUMPTION BY CMA

OPC 43		OPC 53	
Range (kWh/Tonne)	Annual Reduction	Range (kWh/Tonne)	Annual Reduction
< 85	0.00 %	< 87	0.00 %
85-90	0.25 %	87-92	0.25 %
90-100	0.50 %	92-100	0.50 %
100-109	0.75 %	100-111	0.75 %
> 109	≥ 1.00%	> 111	≥ 1.00 %

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PROPOSAL FOR VOLUNTARY REDUCTION FOR POWER CONSUMPTION BY CMA

PPC		PSC	
Range (kWh/Tonne)	Annual Reduction	Range (kWh/Tonne)	Annual Reduction
< 77	0.00 %	< 80	0.00 %
77-82	0.25 %	80-85	0.25 %
82-90	0.50 %	85-95	0.50 %
90-99	0.75 %	95-106	0.75 %
> 99	≥ 1.00 %	> 106	≥ 1.00 %

VOLUNTARY REDUCTION FOR HEAT CONSUMPTION BY CMA

Range, KCal/Kgcl (NCV Basis)	Voluntary Annual Reduction
< 725	0.00 %
725 – 750	0.25 %
750 – 780	0.50 %
780 – 820	0.75 %
> 825	1.00 %

- ❖ Annual Reduction to be monitored only at the end of the block period.
- ❖ Block period may be considered as 3 years.
- ❖ Base Year: 2006 – 2007, Figures may be considered.
- ❖ Hence, terminal year for the Block period = 2009 - 2010

VARIOUS CONSIDERATIONS FOR SETTING UP NORMS

- ❖ Fuel consumption equivalent of waste heat generated power be subtracted from actual fuel consumption for clinkering for comparing with norms @ 3200 Kcal/kWh.
- ❖ Fuel consumed for slag/fly ash drying be excluded.
- ❖ Plants using alternate fuels (excluding pet coke) be given benefit. In such cases, norms be applied excluding the heat value of the alternate fuel used. For example, if a plant has heat consumption of 1000 Kcal/kg, which is contributed by coal – 600 Kcal/kg, pet coke – 250 Kcal/kg and alternate fuel – 150 Kcal/kg, then the effective heat consumption be taken as (1000-150) Kcal/kg or 850 Kcal/kg.

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- ❖ Plant using alternate (waste derived) fuels, needing extra energy for drying and pre-processing, be provided concession to the extent of actual extra energy use. Actual power consumed for preparation of alternate fuels be excluded (Petcoke not considered as alternate fuel).
- ❖ For integrated plants power consumed for limestone handling from quarry to plant and clinker handling inside the plant for despatch to split location grinding unit be excluded. Similarly, power consumption for transportation of cement beyond cement silo to the jetty or loading point be excluded, since mechanical conveying actually replaces truck transport etc, which are less energy efficient and more polluting. Also this would make inter works comparison more meaningful.

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- ❖ Power consumed by utilities for raw meal, cement grinding and cement kiln operation like power consumed for water supply from source to plant, dewatering pumps in the mines or elsewhere, power consumed in the workshop, garage etc. be also excluded. Loss of power in the electrical transmission, transformers etc be also excluded.
- ❖ Plant using 100% pet coke in place of bituminous coal be given a concession of 4 kWh/tonne of cement, as the clinker obtained there from is harder and consumes more energy for cement grinding. Also additional power is required for fuel preparation. The concession may be on pro-rata basis, e.g. 4 kWh/tonne for 100% pet coke use and 1 kWh/tonne for 25% of pet coke use in terms of heat value and so on.

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- ❖ Power consumed for washing of coal and handling up to coal/fuel storage be excluded.
- ❖ Power consumed for beneficiation of low/marginal grade limestone and other raw materials be excluded.
- ❖ Power consumed for slag granulation and transfer to grinding plant slag storage be excluded.
- ❖ High energy efficient plants adopting the “Best Practices” elsewhere in the World should be provided incentives for good performance. Accordingly, plants consistently achieving fuel consumption below 750 Kcal/kg clinker and power consumption below 95 kWh/tonne of cement be exempted from the purview of mandatory energy audit, so long as they maintain the stated level of energy consumption.

ISSUES FOR CONSIDERATION

BEE's Comments during Meeting held on 13 April 2007 between BEE, NCB & CMA/Industry :

- ❖ **Number of plants falling in category of 0% reduction not to exceed 10% of production in that particular category. CMA to prepare and submit to BEE list of plants in each category and plants falling in 0% reduction category.**
- ❖ **Regarding voluntary reduction in electrical energy, CMA to prepare sample calculation to work-out reduction for plants manufacturing more than one variety of cement.**
- ❖ **Reduction to be achieved in 3-year block period should be 5% instead of 3% as proposed by CMA.**

Thank you