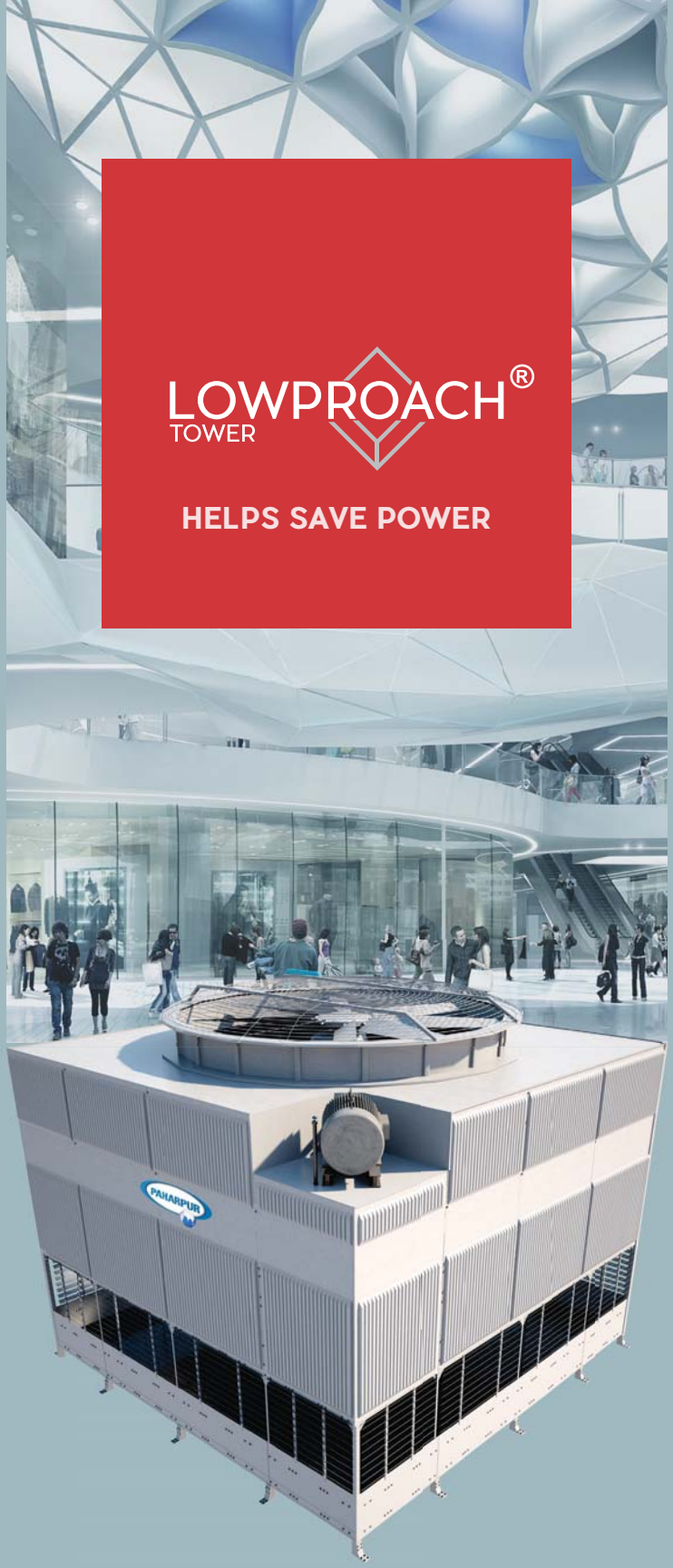

PAHARPUR

Your Full-Service Cooling Technologies Company

www.paharpur.com

Indian Green Building Council
FOUNDING MEMBER

SELECTED Superbrand INDIA 2013/14 Consumer & Industry Validated

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Member

PAHARPUR LOWPROACH® COOLING TOWERS

Paharpur Lowproach® cooling towers can contribute substantially to energy efficiency of a building. These cooling towers can achieve design approach* as low as 1°C (1.8°F), thereby reducing the energy consumption of air conditioning system of a building.

Air conditioning systems are the highest power consumer of a building and chillers are the highest power consuming equipment of an air conditioning system. Thus it is imperative to improve the operating efficiency of a chiller in order to increase the energy efficiency of a building. Lowering the cooling tower approach and thereby reducing the condenser water temperature at chiller inlet can result in significant reduction in chiller power consumption. The higher initial cost of the tower is offset by this energy saving within 12 months in most cases.

*Approach is the difference between cold water temperature at cooling tower outlet and the wet bulb temperature.

LOWPROACH® TOWER

APPROACH AS LOW AS

1°C (1.8°F)

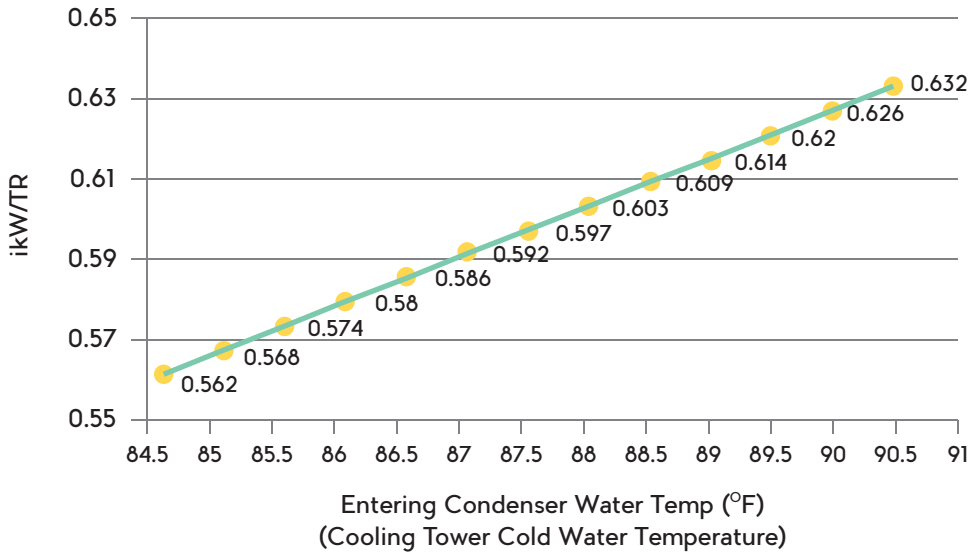
A TYPICAL ENERGY SAVING ANALYSIS

Chiller : 550 TR

Cooling Tower Selection for Case 1 (Approach = 7°F) & Case 2 (Approach = 2°F) with 2 options

Parameter	Standard Design (7°F approach)	Lowproach® Design (2°F approach)	
		High Fan Power (Option-1)	Low Fan Power (Option-2)
Water flow rate (USGPM)	1650	1650	1650
Hot water temperature (°F)	100	95	95
Cold water temperature (°F)	90	85	85
Wet bulb temperature (°F)	83	83	83
Cooling Tower Model	6.1KF - 6153	9KF - 91784 x 2 Nos.	9KF - 91883 x 2 Nos.
Motor kW	22.0	2 x 15.0	2 x 11.0
Tower Price (₹)	7,68,000	18,88,000	22,45,000
Fan bkW	20.6	2 x 14.2 = 28.4	2 x 10.2 = 20.4

A typical chiller power consumption graph



ikW = input kiloWatt | TR = Tonnes of Refrigeration

LOWPROACH® TOWER

ENERGY SAVING

LOWPROACH® TOWER

REDUCED
CHILLER POWER CONSUMPTION

LOWPROACH® TOWER

LESS THAN 12 MONTH PAYBACK PERIOD

From the previous chart,

ikW/TR @ 90°F : 0.625

ikW/TR @ 85°F : 0.566

ΔikW/TR : 0.625 - 0.566 = 0.059 ≈ 0.06

∴ Power saving for a 550 TR Chiller = 0.06 kW/TR x 550 TR = 33.0 kW

Considering power tariff of ₹ 10 per unit (kWh), the overall energy saving in a year for an air conditioning system for 5000 hours of operation would be as follows:

Parameter	Lowproach® Design (2°F approach)	
	High Fan Power (Option-1)	Low Fan Power (Option-2)
ΔTower Price (₹)	18,88,000 - 7,68,000 = 11,20,000	22,45,000 - 7,68,000 = 14,77,000
ΔFan Power (kW)	28.4 - 20.6 = 7.8	20.4 - 20.6 = -0.2
Net energy saving (kW)	33.0 - 7.8 = 25.2	33.0 - (-0.2) = 33.2
Energy cost saving (₹)	25.2 x 5,000 x 10 = 12,60,000	33.2 x 5,000 x 10 = 16,60,000
Payback period (months)	11,20,000/12,60,000 x 12 = 10.7	14,77,000/16,60,000 x 12 = 11.0

For different chiller plant capacities and different cooling tower models, the payback period will vary. In most cases, it will be less than 12 months. After this payback period, the energy savings accumulate for the rest of the plant life.

LOWPROACH® TOWER

LOWER BUILDING CARBON FOOTPRINT

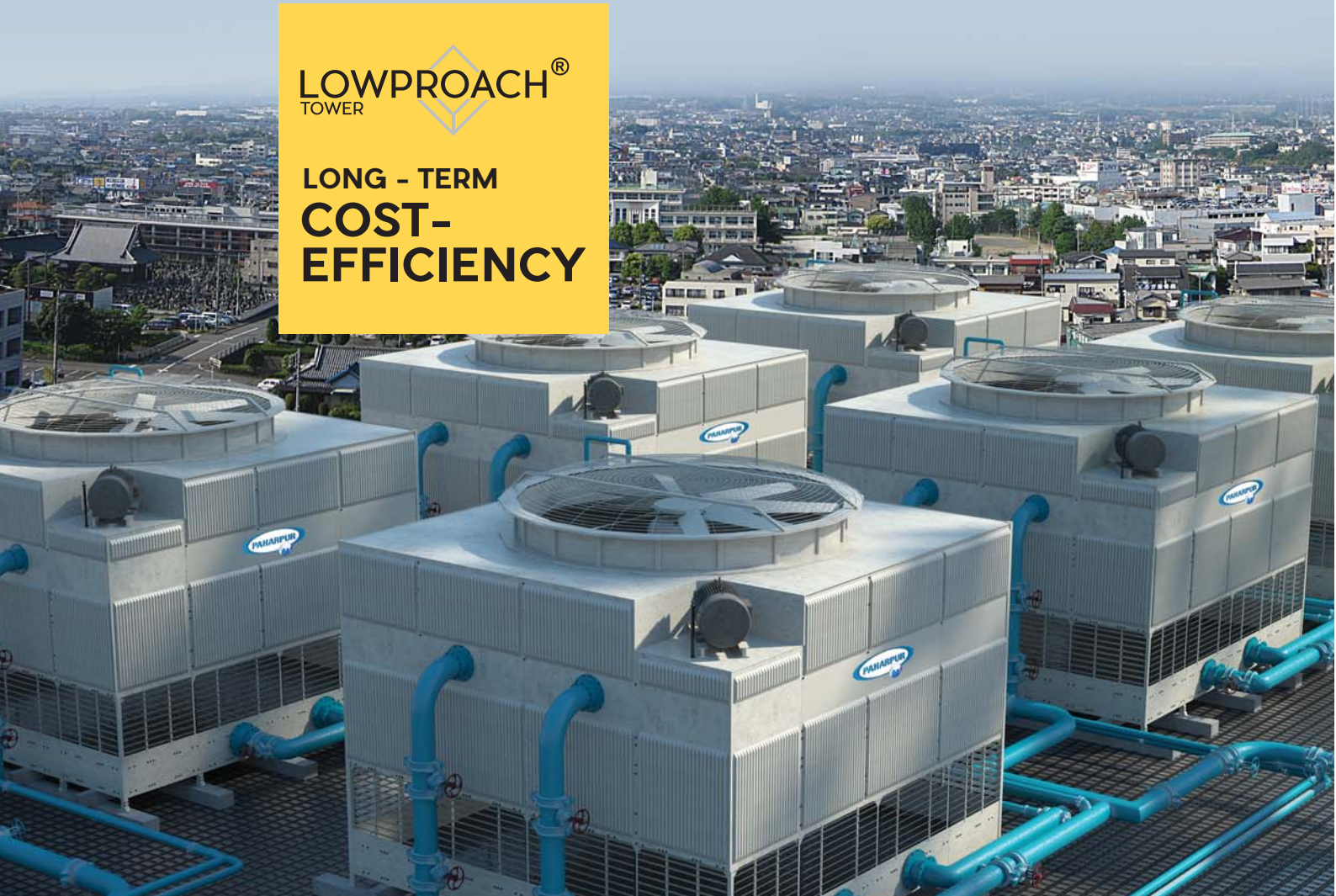
ENERGY EFFICIENCY WITHOUT COMPROMISING ON LIFE-CYCLE COSTS.

Paharpur has designed and supplied cooling towers for buildings with approach as low as 1°C, making the air-conditioning plants of these buildings more energy efficient and reducing their energy consumption during the peak Indian summer-monsoon months to lower-than-ever levels. In addition to reducing the building's carbon footprint, these cooling towers are also more cost-efficient in the long run.

So, if you are looking to take your building to the next level of energy efficiency without compromising on life-cycle costs, look to the leader in cooling tower technology - look to... Paharpur.

LOWPROACH® TOWER

LONG - TERM COST-EFFICIENCY



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Paharpur Cooling Towers Ltd

(ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007 Certified)

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International Offices
USA | Switzerland | Belgium | Bahrain

Our sales representatives are located in several countries and Indian cities.
Contact information shall be made available on request.

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