



Green building experiences of Infosys

Modern buildings



Modern buildings



Modern buildings



Modern buildings



Modern & Functional buildings

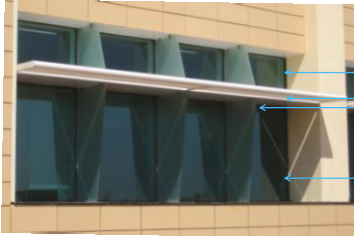


Mysore SDB 5 building with above strategies

Bright day light without glare at SDB-5 Mysore

Modern & Functional buildings

| 7



Day light pane
External shading
View pane

Modern & Functional buildings

| 8



SDB-1, Infosys Hyderabad campus

Modern & Functional buildings

| 9



SDB-6, Infosys Mysore campus

Modern & Functional buildings

| 10



SDB-2 & 3, Infosys Hyderabad campus

Modern & Functional buildings

| 11



SDB-7, Infosys Mysore campus

Modern & Functional buildings

| 12



SDB-4 & 5, Infosys Hyderabad campus

Impact of daylighting

| 13



Impact of day lighting

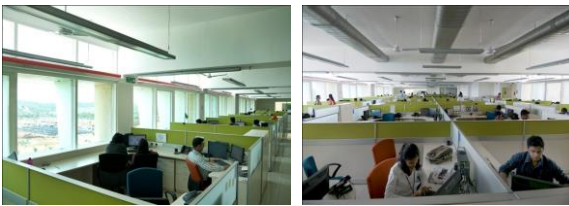
| 14



Provides pleasant office space
Improves:
Employee health
Employee productivity
Addresses Vitamin D deficiency

Impact of daylighting

| 15



From AC to Non-AC passive design

| 16



Pune food court – original design proposed by architect

Actual building without glass façade

~ 2.1 Cr. avoided capital cost
~ 60 lakhs avoided annual O&M cost

Building shape and orientation

| 17

- Passive design: Right orientation - Restricted building span to 18 m



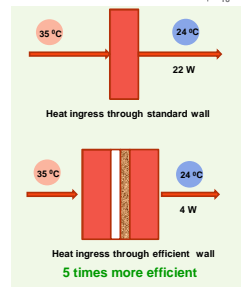
Window-wall ratio < 30%



Reduce heat gain

| 18

- Efficient building envelope
 - Wall Insulation (U value less than 0.4 W/m² K)
 - Roof Insulation (U value less than 0.34 W/m² K)
 - Double glazing with argon gas to lower U value
 - Low SHGC with low e glass (SHGC less than 0.2 and U value < 1.2 W/m² K)
- Integrated design approach
 - Performance based, common goal for entire design team
 - External heat gain not to exceed 0.75 W/sqft

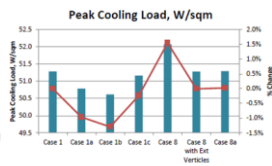


Energy simulation

| 19

Thermal analysis and study conducted for,

- All building facades and orientations
- Various wall insulation, roof insulation, shading and glazing configurations
- Provides optimized design for entire building envelope
- Helps compare all scenarios and take smart decisions



Example: Evaluation of peak cooling load with various scenarios of building envelope through simulation

Infosys Mysore case study: Integrated design approach

| 20

Sl. No.	Case	Cooling capacity required (TR)	Annual energy consumption (kWh)	Maximum electrical load (kW)
1	Conventional building envelope	622	3,244,284	1,052
2	Efficient building envelope	530	3030908	968
3	Efficient lighting design	510	2713390	882
4	Efficient computers	486	2358776	778
5	Variable Air Volume system for AC	486	2080462	754
6	Heat Recovery Wheels for AC	400	2015430	682
7	Ultra high efficiency chiller	400	1992156	650
8	Efficient chilled water system design	400	1960898	640
9	High efficiency cooling tower	400	1846532	632
10	Lighting controls	400	1,775,706	600

Impact of new design on first and operating cost

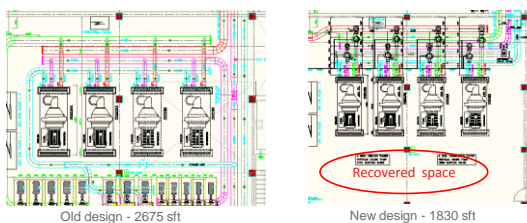
| 21

Infrastructure required for 1 million sqft,

Sl. No.	System Description	Units	New designs	Old designs	Conventional
01	Total electrical load	MW	3.25	6.5	10.0
02	Transformer capacity	MVA	4.0	7.5	12.0
03	DG set capacity	MVA	5+2.5	9+3	15+3
04	Annual energy consumption	Million kWh	8.5	20	25

Impact of new design – Space savings

| 22



32% space saved because of inline pumps and VPF

Cool roofs

| 23

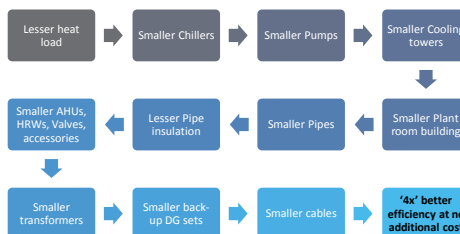


Reduces building heat gain and urban heat island effect

- 2.6 million sqft area covered with white roof
- About 5% reduction in HVAC energy
- ROI : 2 years

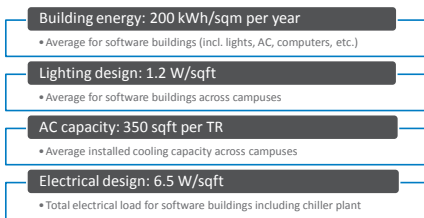
Multiple benefits from single expenditure

| 24



2007-08

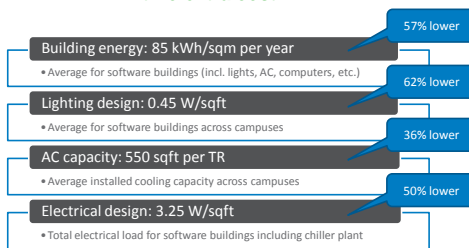
| 25



2013-14

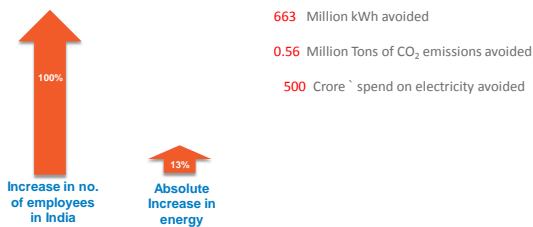
At no extra cost

| 26



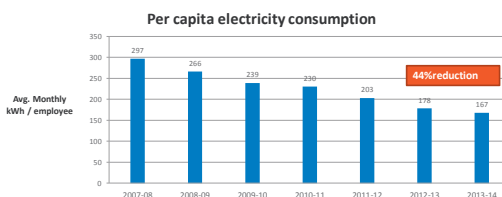
Growth from 2008 to 2014

| 27



Energy Efficiency – kWh / employee per month

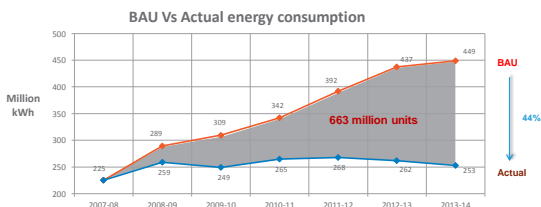
| 28



44% reduction in per capita energy consumption in last 6 years

Avoided energy consumption

| 29



Industry Leadership

| 30

- 11 buildings have achieved LEED platinum rating, making us no.1 in India for office buildings.
- 2 buildings have achieved GRIHA 5-star rating (highest level in the MNRE National rating for Green Buildings)
- Infosys buildings have an annual Energy Performance Index of **85 kWh/sqm/year**, lowest in the industry
- Over 3 million sq.ft of our buildings are currently in various stages of certification for LEED or GRIHA rating system
- Won the 2014 **ASHDEN Gold award** (London) for sustainable buildings

Conclusion

| 31

- Green Buildings (rather "Rightly designed buildings") always have a lower initial cost
- Green buildings have a significantly lower operating cost
- Green buildings have several associated benefits for the occupants

For more information, refer to Infosys Sustainability report on www.infosys.com

