

ORANGE COUNTY  
FOUNDATION  
towards sustainable development



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## OUR MOTTO .....

- Nature is sufficient for everybody's need but not for everybody's greed.  
- Mahatma Gandhi

# CHANGING FACE OF OUR PLANET-----

Unplanned development – the root cause of  
Global warming – an impending disaster ahead



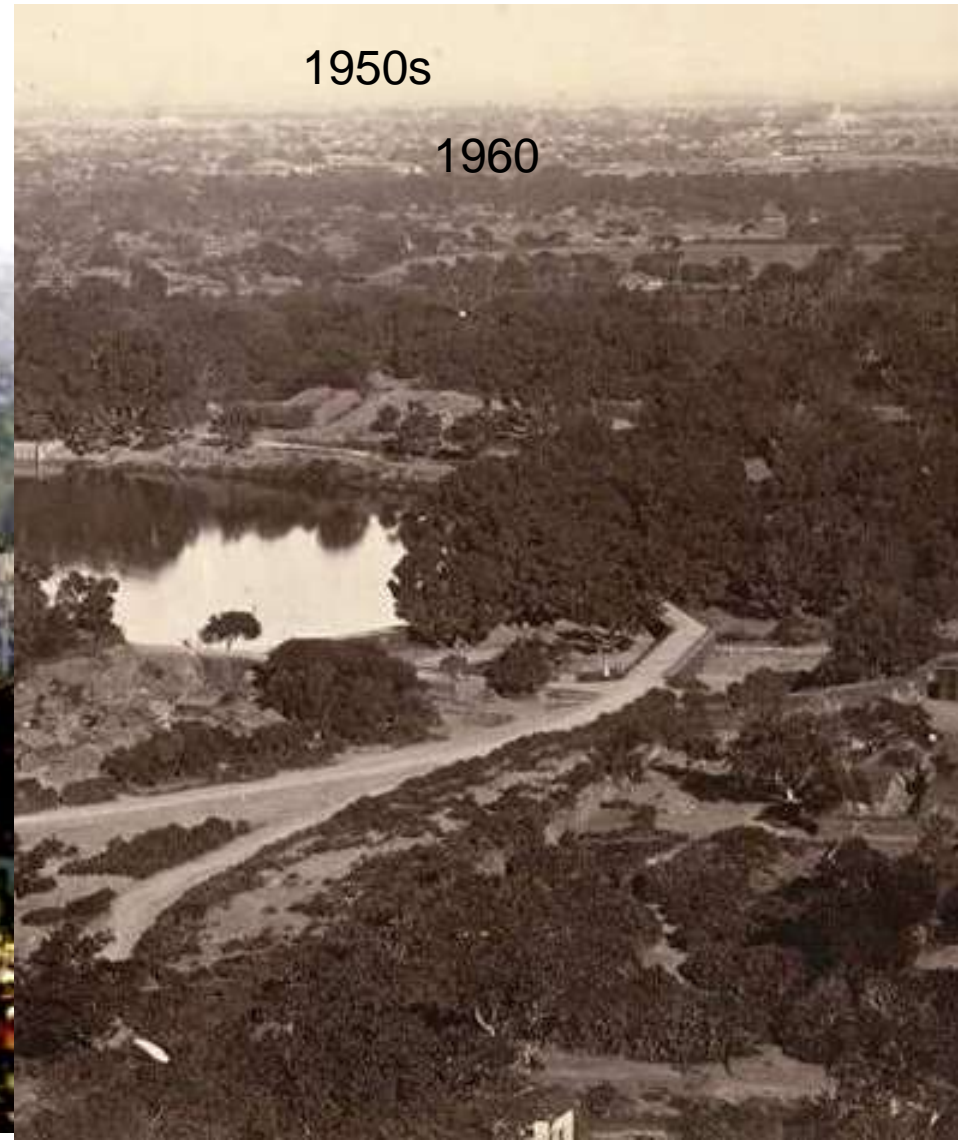
# Changing face of OUR NATION

2000



1950s

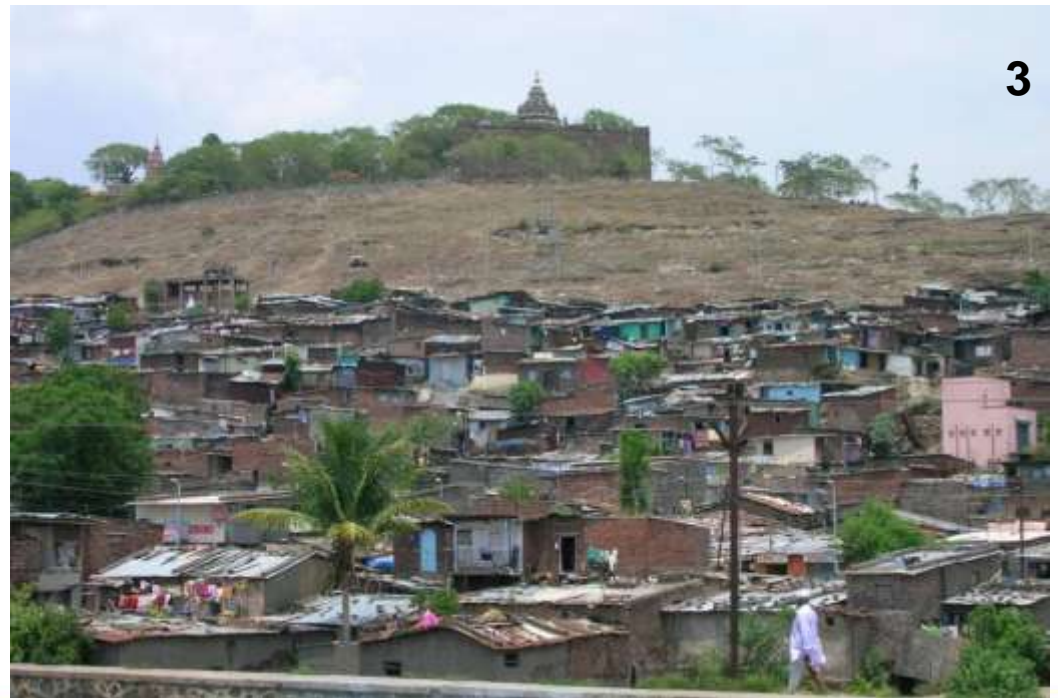
1960





## CHANGING FACE OF OUR CITY - Parvati – The land mark of Pune

1. Pre-independence period
2. Late 1950s
3. At the end of 20<sup>th</sup> century



**ANY ANSWER FOR THIS ?**



**Orange County Foundation Presents.....**




**Unique concept of  
multi storeyed residential buildings  
towards  
100% Self Sufficiency**

# Orange County I

- People loved Orange county I. 80 families came to stay with us. That includes eminent personalities like Software Professionals, film stars, researchers even academicians.
- What was speciality of Orange County I?

The way we have designed every room-so that person living in gets infinite light & infinite ventilation. Every home is designed to give the real feeling of living in a vast, open landscape, uncluttered by other buildings. Every room in every apartment is so placed as to give abundant natural light and maximum cross ventilation, all through the day, all through the year. The abundant flow of fresh air translates into healthy, energetic & “no sweat” living.

# Orange County I By SCN Associates

- 
- Location:- Pashan Baner link road, Pune,India.
  - Phase I:- Total flats:-80
  - Stage:- Completed- Oct 2007

# Orange County -II

- The all around appreciation received by “Orange County-I” had spurred us to conceive “Orange county II” and to push the original concept further, to create “Ecologic Homes”
- We have now created 36 more “Ecologic homes” that are not only spacious, well ventilated and well lit but also extremely environment sensitive.
- They are based on unique concepts of self sufficiency such as
  - a) 100% green energy
  - b) Root zone cleaning system for STP( Sewage Treatment)

# Orange County II by SCN Realtors



•Location:- Pashan Baner link road, Pune.

•Phase II:-Total flats:-36 Stage:- Possession given on July 2009.

# **“ORANGE LIFE”**

## **BY SCN Builders & Developers**

- The experiments done in Orange County Phase-II are now successful. Hence with the same vision, we have planned residential cum commercial project- “Orange Life”, which is under construction
- This Project will have two floors of basement (each 20,000 sq.ft ), 3floors of commercial (each 12,000 sq.ft) which includes a video theater cum multipurpose hall, Gym cum swimming pool & 8 floors of residential (2 bhk-1200 sq.ft-16 Nos., 3bhk-1560sq.ft- 13 nos.)

# “ORANGE LIFE”

## Front view



# What do We mean BY “GREEN Homes”

- A home built upon logic and eco-sensitivity. For example, we ourselves will produce sufficient energy from the sun and the wind for most of the requirement. We will save energy with the help of latest technology. We will distribute hot water to every resident with the help of a programmable logic control (PLC) based solar water heating system. We will build our houses with eco-friendly material. We will make our rooms spacious, well lit and airy with engineering precision. We will keep our surrounding forest clean green and pristine.

# STEPS TO ACHIEVE

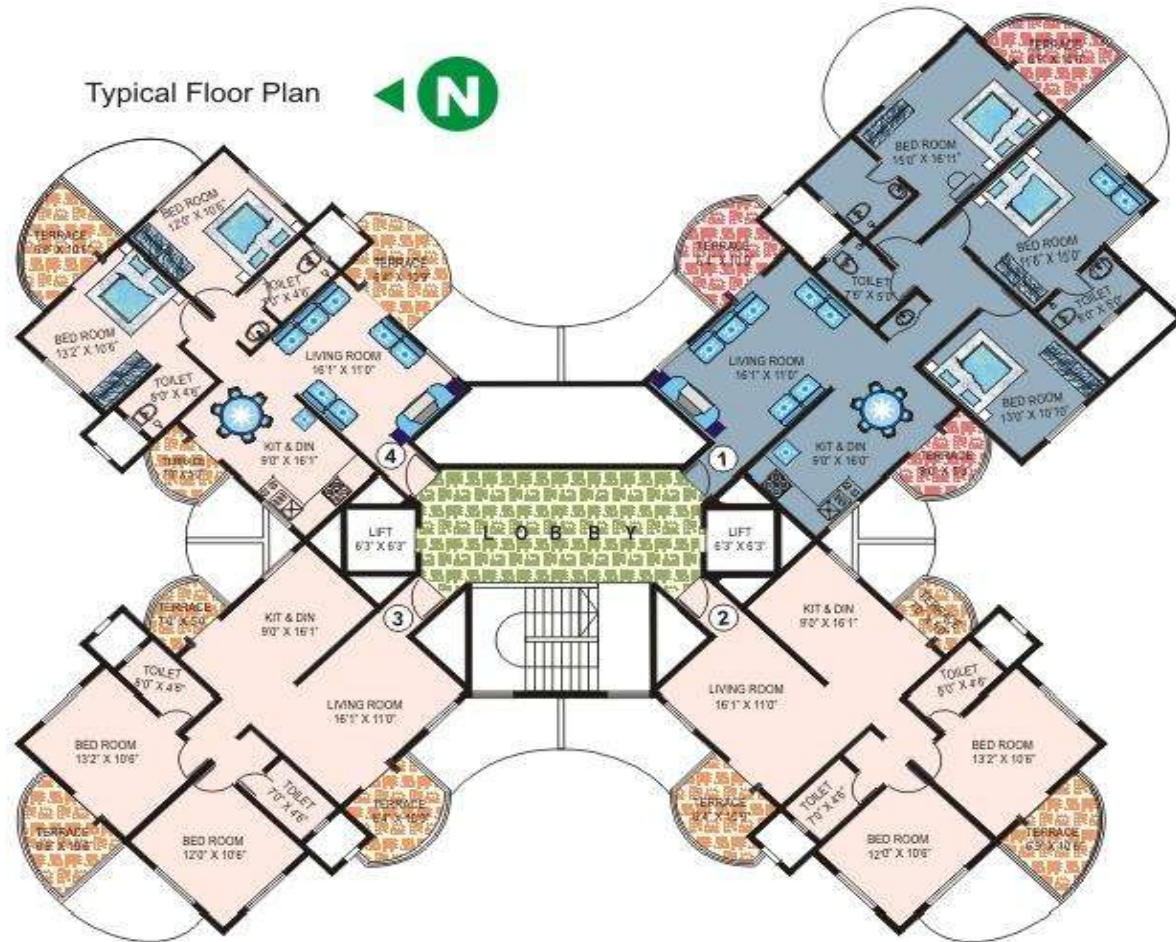
- REDUCE USE OF ELECTRICITY
- USE ENERGY EFFICIENT FIXTURES AND FITTINGS
- USE OF ECO POWER FOR MINIMUM BASIC NEEDS
- INSTALLATION OF SYSTEM OF OPTIMUM CAPACITY

# Consideration for planning of residential area

- Building is planned to have maximum Natural light, Natural Ventilation
- All flats are “Three sided open ”.
- No Common wall in between any of the flat which achieves very good cross ventilation
- Total area of opening (inlet & outlet) is more than 30% of floor area.
- Minimum lux level- under overcast sky conditions for a typical summer day

Kitchen/Dining	:-	200
living room	:	50
study room/Common bed	:-	160
circulation	:-	30

### Typical Floor Plan



#### EVEN FLOOR

AREA STATEMENT IN SQ.FT.				
FLAT NO.	TYPE	CARPET	TERRACE	SALEBLE
201	3BHK	1109.00	170.00	1552.00
202, 203, 204	2BHK	721.00	160.00	1041.00

#### ODD FLOOR

AREA STATEMENT IN SQ.FT.				
FLAT NO.	TYPE	CARPET	TERRACE	SALEBLE
101	3BHK	1110.00	266.00	1616.00
102, 103, 104	2BHK	721.00	191.00	1061.00

Ground Floor Shop Areas ~1&4: 472 sq.ft, 2&3: 493sq.ft.

# Consideration for Execution of Residential area

- All points (light, fan, TV, computer, etc.) except power points in all flats have “Green Energy” as primary source & grid energy as “Stand by”.
- All flats have solar water heating system.
- Common amenities such as lift, water pump. etc. are running on “Green Energy”
- Common lighting in outdoor passage as well as parking areas have “T5-28W” tube lights. These all light points have time & motion sensors i.e. after sunset they will automatically turned on & then turned off only to start when there is any motion, which will again turned off when there is no motion for 1 minute.
- Again all these light points are on “Green Energy”.

- One of the two lifts is “Green lift” i.e. it is machine room less, gear less and weight-sensing. The energy consumption is as per the weight inside the lift & this lift is always running on “green energy”.



- 1.-Lift front view-phase-II
- 2.-Compact machine-green color-Phase-II
- 3.-Weight sensing equipment –Phase-II

- It is compulsory to use energy efficient fixtures & fittings in each flat such as
  - All Tube lights- T5-28 W or CFL only
  - All Toilets & terraces- CFL lights only
  - All fans - energy saver or power saver -50 W only
- Every flat has Blink Free Changeover (BFC) switch, which limits use of current from “Green Energy” up to 1.5Amp. i.e.
- If the consumption exceeds 1.5Amp, the system will change automatically from “Green Energy” to “Grid energy”. This is shown by LED on the changeover box, which creates awareness towards energy saving.
- Normally minimum 3 T5 tube lights, 2 CFL, 2 Fans, 1 TV/computer can run in the limit of 1.5 Amp current.
- Green energy is free of cost to flat holders.

# BFC Switch in every flat-Phase -I



# Hybrid Power System

- The system has two windmills located on top of the terrace, each of capacity 5KW peak, 36 crystalline solar PV panels - each of capacity 120Wp & 54 thin film CIGS solar PV panels- each of capacity 144Wp i.e. totaling to 12 KW peak, which will be able to produce, combined together, 60 units per day.
- The Hybrid Power Collector (HPC) is designed to generate electricity even at wind speed as low as 2m/sec.(being hybrid energy source & using boost charging method)
- The HPC has display panel which shows all the details of electricity produced by both windmills & solar PV Separately. For last 365 days.
- The battery is "SMFVRLA" type- 2V 200Ah, 180 Nos., having expected life span of around 10 years.



WIND-1- 5kw



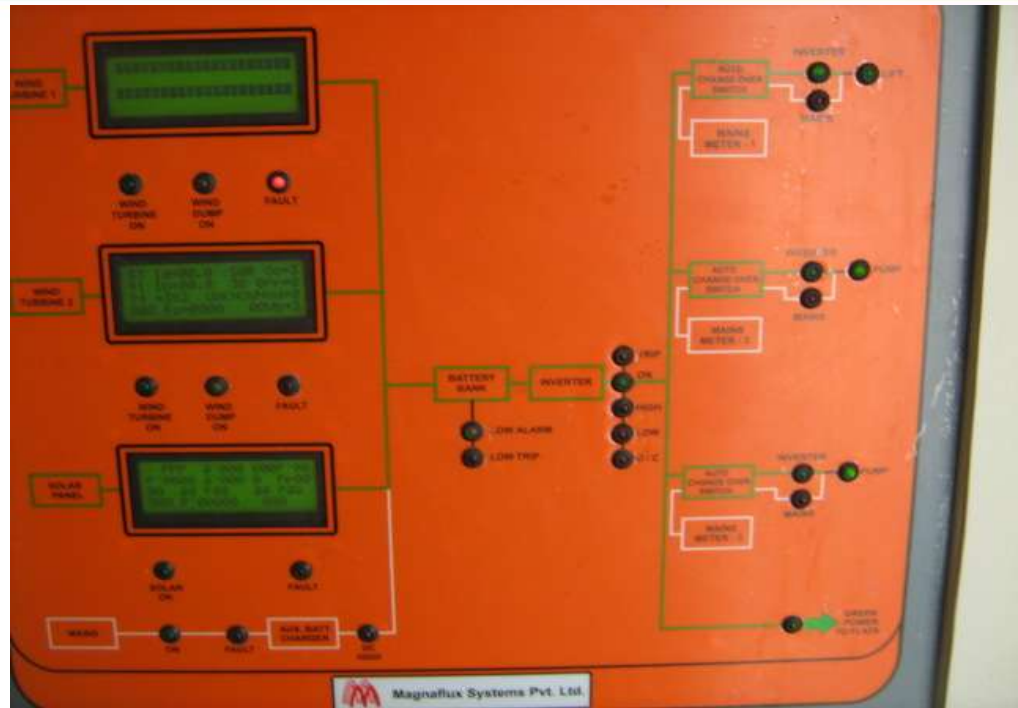
WIND-2 -5kw



SOLAR PV-4.3 kw

## Wind turbine and PV cells





HPC AND DISPLAY PANEL OF HPC SHOWING UNITS PRODUCED BY WIND-1,WIND-2 & SOLAR PV AS WELL AS CONSUMPTION STATUS BY LIFT,WATER PUMP, COMMON LIGHTS & ALL 36 FLATS.-Phase -II

# BATTERY ROOM SETUP – Phase II



# DELTA- Innovative Solar Water Heating System

- The maximum domestic electrical consumption is attributed to water heating. (approx. 55% of domestic electrical consumption in this part of country.) Therefore to minimize this consumption, we have provided fully programmable solar water heating system of 5000 LPD i.e. flat details .

2BHK-27flats-per flat 125 liters=	3375
3BHK-9 flats-per flat 150 liters=	<u>1350</u>
	4725 LPD

- In this option there is no big solar water tank on the roof. Instead, each flat is provided with one insulated hot water tank of the capacity- for 2BHK-125LPD & for 3BHK-150LPD, fitted with electrical heating coil of 3KW rating with ISI mark thermostat.
- There is also be Programmable Logic Controller based automation to ensure that each flat gets fixed quantity of hot water, and also the electrical heater maintains the minimum reserve level of hot water at any given time.

- Problems associated with conventional solar water heating system for a multistoried residential building.

1	Lack of control on consumption of hot water by members resulting in unequal hot water distribution leading to misunderstanding.
2	The no. of persons in a flat & hot water usage habits per person vary resulting in failure of designed capacity standard requirement, leading to disputes.
3	Round the clock availability of hot water if provided, means uncontrolled, intermittent use. This results in mixing of cold water in the hot water tank & unsatisfactory system performance.
4	If provided-Fixed hours only, availability of system hot water puts restriction on use at desired time & defects the purpose of system for free hot water round the clock.
5	If provided with Electrical back- up, consumes electricity from common meter
6	Heavy heat loss during transfer of hot water from the tank at the roof top to flat due to difference of temperature at the peak bathing hours in morning/evening
7	Heat loss from the hot water storage tank being exposed to the weather on terrace

- Akson's "DELTA" is a unique fully programmable solar –grid hybrid water heating system that offers a hot water system eliminating all above problems associated with the conventional solar systems ensuring instantaneous hot water on 24X365 basis
- Each flat has SMART HOME DISPLAY fitted inside toilet which will indicate
  - High level i.e. 125 Liters
  - Minimum level i.e. 25 Liters
  - Power ON
  - Heater ON
  - Override
- Thus the "Solar Water Heating" System will save at least 7.6 units/flat/day for average 300 days. i.e.  
 $7.25 \times 27 \times 300 + 8.7 \times 9 \times 300 = 82215$  units yearly.



SOLAR WATER HEATING PANELS



MAIN DISPERSING TANK



INDIVIDUAL FLAT TANK



DUCT VIEW

WATER HEATING SYSTEM

# SMART HOME DISPLAY- Phase -II



# Sewage Treatment Plant by Natural process of Root

## Zone Cleaning System

- Presently sewage is treated by conventional treatment with physical & biological treatment units. The principle of conventional sewage treatment is based on removal or destruction of pollutant by physical, chemical & biological methods to bring down pollutant within permissible limits. Conventional treatment system requires capital cost, energy to operate system, skilled manpower & maintenance cost of mechanical equipments.
- Another natural treatment system existing in nature & well known to this subcontinent is use of wetland species for sewage treatment. This ancient technology using wetland species is named as ROOT ZONE CLEANING SYSTEM. The name itself indicates that root zone of plant along with the soil system plays an important role in wastewater treatment. The treatment efficiency is 90 to 98%
- Salient features of RZCS:-
  - Aerator & recirculation pumps are not required so energy is not required
  - It uses Phragmatis Austalis as wet land species.
  - It is very cost effective system.
  - Gives Crystal clear water safe for reuse

# Initial Stage



# Current Stage

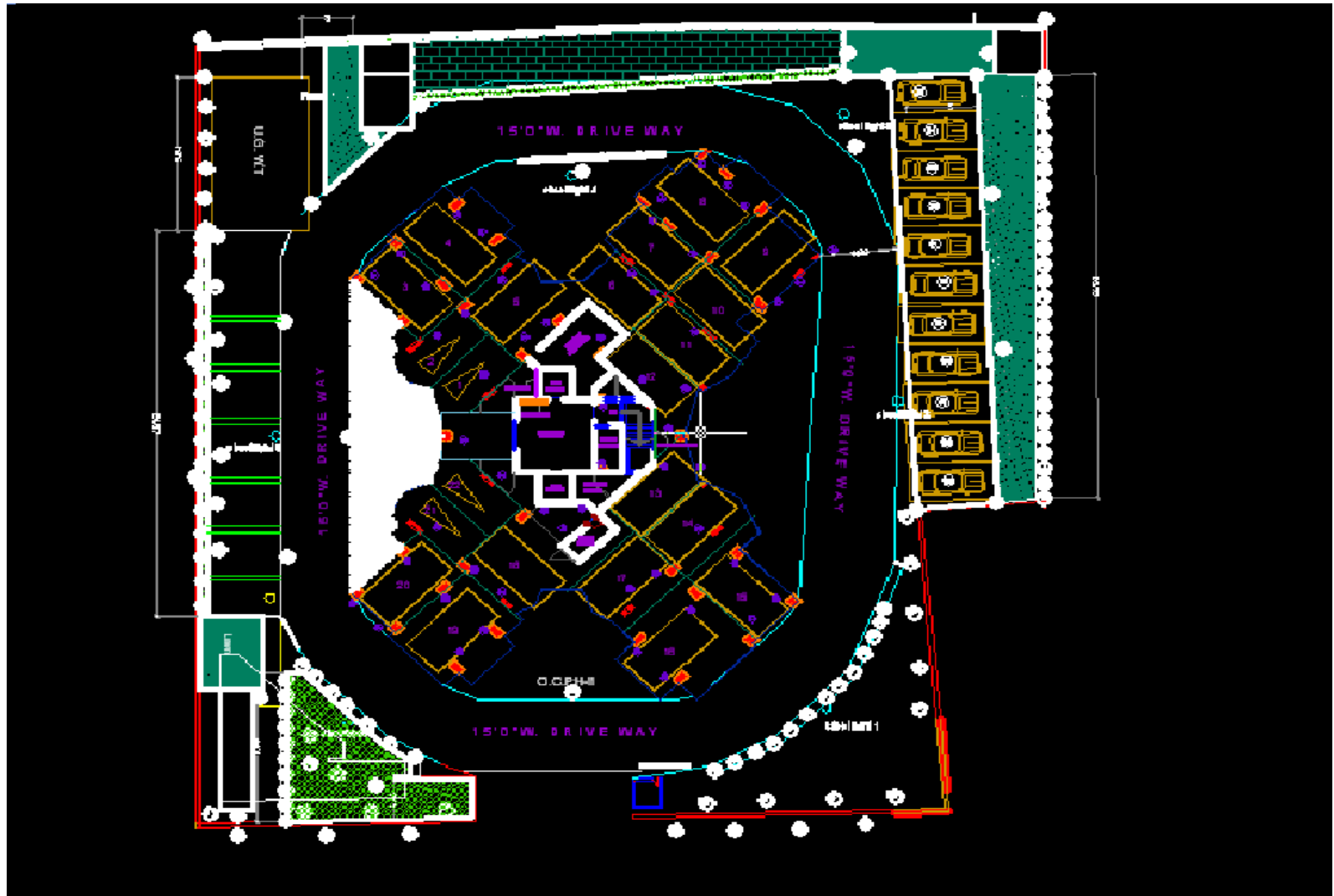




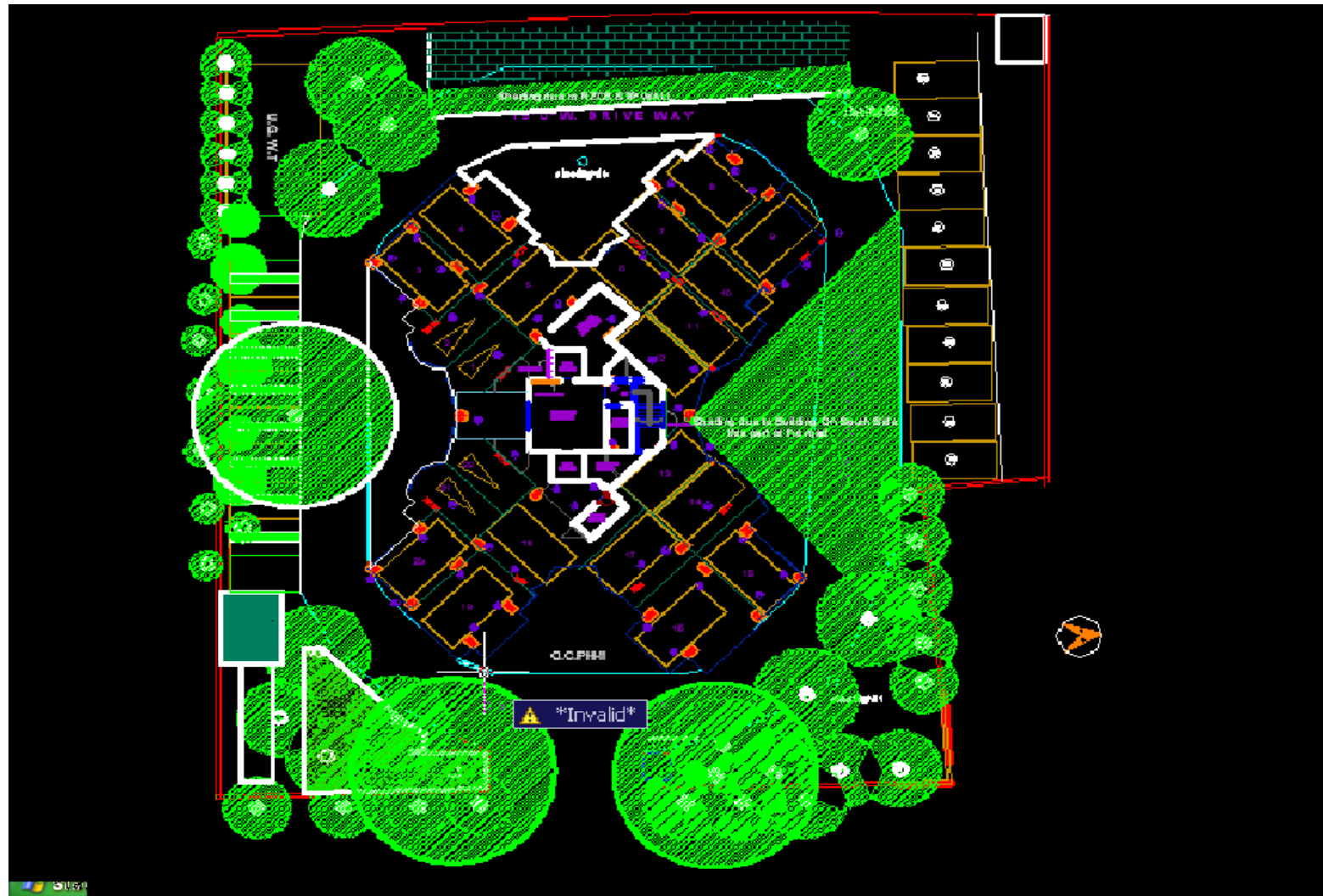
# Landscape details

- All trees planted will be “Native Fauna” of Pune. e.g. Bahava, Kadamb, Saptaparni, Sitaphal, Shirish, Mango, Sonchafa, Limbu.
- The trees are planted in such a way that after 5 years most of the paved area will be covered by shadow of trees.

# Plantation Layout



# Shading layout



# Other Innovative/Eco sensitive measures

- Designated parking lot for vehicles which will use "Alternate fuel". Electric charging point for charging of vehicles is provided which will use "Green Energy" only.
- All WC are with dual flush system with a flow rate of 3L & 6L per flush
- We have provided centralized collection facility at ground floor for e-wastes, batteries, drugs, clinical and hazardous wastes.



- We have also provided separate chutes for collection & separation of 100% bio-degradable, and non-biodegradable wastes. Also we have onsite treatment plant using vermi composting for the treatment of 100% of organic wastes. The manure from bio-degradable wastes, will be utilized with in the site itself.



शक्ति

मुकवत

ओल्या कचऱ्याचा स्वतःप्रकल

आनील तळपावत एक फूट उंचीतील स्वतः

# SPM Level Measuring Machine



Handicap Access



# BENEFITS

- Every unit of solar energy saves 3.3 Ltrs of fresh water and prevent release of 1kg of CO<sub>2</sub>
- By adopting solar & wind solutions, we have become part of global effort towards achieving Carbon emission reduction targets
- The concept of “Green energy” reduce pick demand on grid
- No Generator back up – so clean energy
- Very low running cost
- Synchronized green & grid power will provide uninterrupted supply.

# BENEFITS

- Satisfaction of preserving nature-Native flora & fauna.
- Reduction in property Tax of corporation from 10 to 50% for flat owners
- Reduction in power bill for each & every flat as well as for common areas which will be almost zero .
- Motivate Others to Think.


# Total Energy Produced & saved yearly

- Solar water heating system-82215 units
- Solar wind hybrid production system-  $60 \times 300 = 18000$  units.
- Energy saved using efficient fixtures such as
  - T5 tublights - $212 \text{Nos} \times 20 \text{W} \times 6 \text{Hrs} \times 365 \text{ days} = 9285$  units
  - CFL- $162 \text{Nos} \times 30 \text{W} \times 2 \text{Hrs} \times 365 \text{ days} = 3547$  units
  - Power saver fans - $117 \text{nos} \times 30 \text{W} \times 6 \text{Hrs} \times 365 \text{ days} = 7686$  units
  - Green lift –  $5 \text{KW} \times 60\% \times 5 \text{Hrs} \times 365 \text{ days} = 5475$  Units
  - Thus total energy saved =  $25993$  Units, say  $26000$  Units
  - Thus total energy produced & saved =  $126215$  units
- i.e.  $220870$  units required to be produced by grid power due to transmission & distribution losses. (as per the data of MSEB)
- Hence the Total CO<sub>2</sub> emission saved –  $187$  tonnes / year


# Indian answer to global warming-----

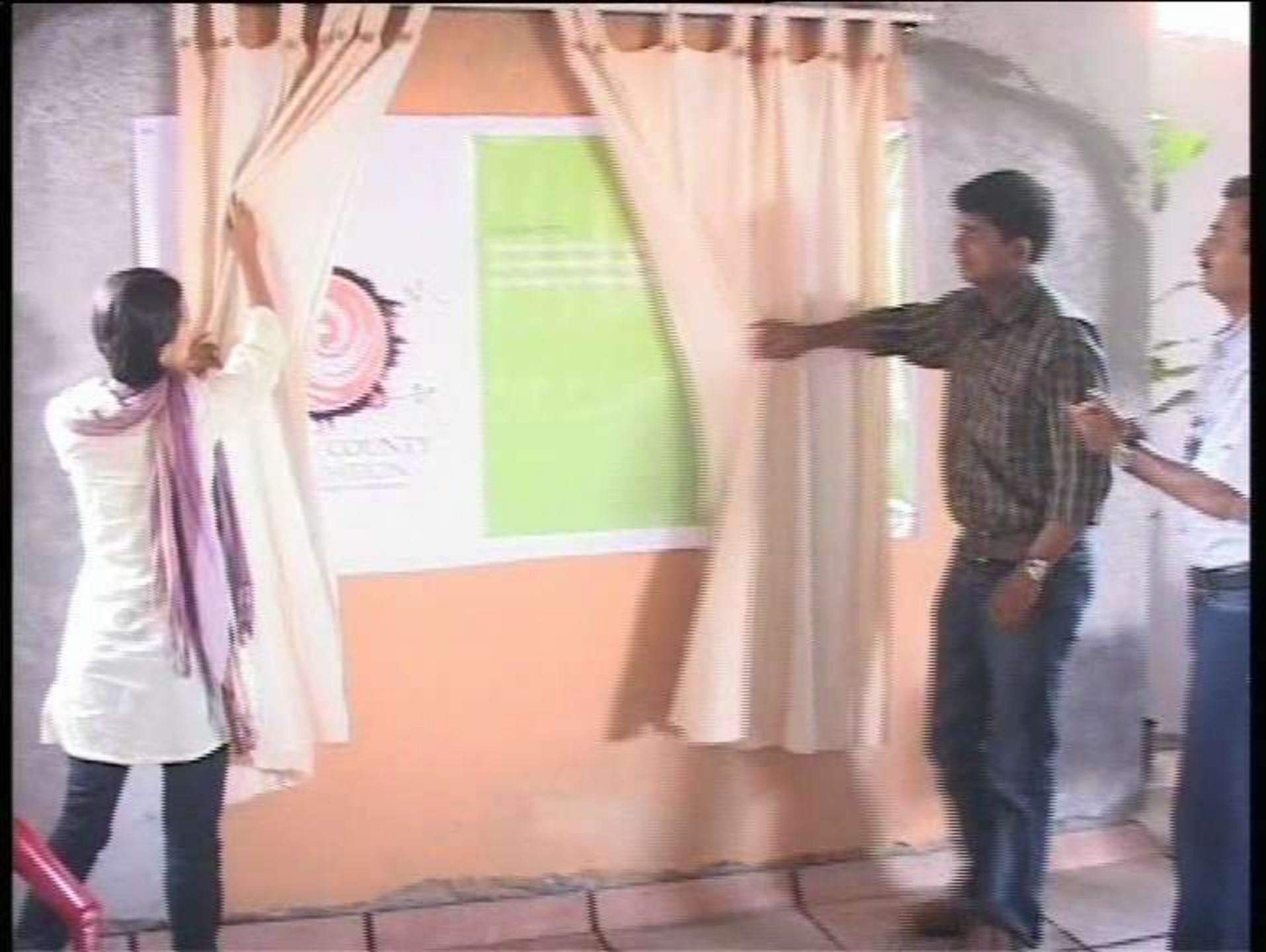
## Orange County Foundation

- The various experiments done at Orange County and success achieved led to the forming of Orange County Foundation
- The foundation is a team of consultants working for common cause.
- It is a registered organization.
- It is working on various projects related to eco friendly solutions and technologies.
- It is a one window solution provider



**LAUNCHING  
OF  
FOUNDATION**





# Goals to achieve....

- Net ZERO Carbon Buildings by calculating Bio mass equivalence - commitment of generation of bio mass consumed for & total energy consumed in form of fossil fuel, electricity during the construction of building & within 25 years of building life span.
- To achieve affordable net ZERO energy homes which will be much more energy efficient than today's typical buildings, with renewable energy supplying their power needs.

# Team to make it success

- Architect- Mr. Swapnil Kshirsagar  
Mr. Amit Bhatt
- Green energy Consultant- Mr. Amar Chakradeo
- System design – Mr. Anand Pendse
- Solar Water Heating system- Mr. M.D. Akole
- Enviro consultant - Mr. R.V.Saraf.
- Bio Diversity Expert - Mr. Vilas Gogate

# Presented by

- MR.SONIGRA SANDEEP R.
- MR.CHHAJED ANAND C.
- MR.NIMHAN TANAJI R.

# Motivation



**JAI HIND**