



# OPPORTUNITIES OF SOLAR HEAT IN DAIRY INDUSTRY

OPPORTUNITIES OF SOLAR HEAT  
IN INDUSTRIAL PROCESS HEAT (SHIP) IN INDIA

INITIATIVE OF NDDB



# ABOUT NDDDB

- THE NATIONAL DAIRY DEVELOPMENT BOARD HAS BEEN CONSTITUTED AS A “BODY CORPORATE” AND DECLARED AS AN **INSTITUTE OF NATIONAL IMPORTANCE BY AN ACT OF PARLIAMENT.**
- FOUNDED IN 1965, STRIVES FOR TRANSFORMING DAIRYING FOR AN INSTRUMENT FOR DEVELOPMENT OF INDIA’S RURAL PEOPLE ESPECIALLY FARMERS.
- LAUNCHED “**OPERATION FLOOD**” PROGRAMME WITH WORLD BANK LOAN, TO MAKE INDIA AS THE WORLD’S LARGEST MILK PRODUCING NATION.
- PRESENTLY NDDDB EMPLOYS AROUND 450 PROFESSIONALS IN VARIOUS FIELDS RELATED TO ESTABLISHMENT OF FARMER MANAGED CO-OPERATIVE DAIRIES, FEED PLANTS, CO-OPERATIVE DEVELOPMENT, TRAINING, ANIMAL HEALTH, NUTRITION, BREEDING ETC





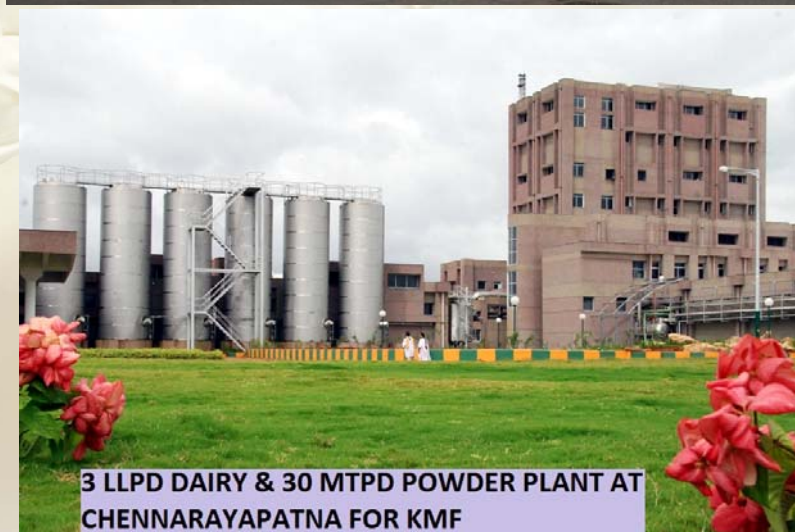
# ENGG SERVICES

ENGG GROUP PROVIDES TECHNICAL CONSULTANCY FROM CONCEPT TILL COMMISSIONING FOR :

- MILK PROCESSING PLANT
- MILK POWDER PLANT
- CATTLE FEED PLANT
- BYPASS PROTEIN PLANT & MINERAL MIX PLANT
- MEGA SEMEN STATION
- HIGH SECURITY ANIMAL DISEASE LABORATORY

WITH THE LATEST TECHNOLOGY FOR MAINTAINING :

- ENERGY EFFICIENCY / QUALITY / PRODUCTIVITY / FOOD SAFETY / ENVIRONMENT



3 LLPD DAIRY & 30 MTPD POWDER PLANT AT CHENNAIRAYAPATNA FOR KMF



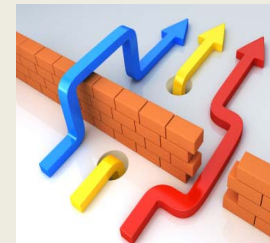
## TAKEAWAY OF NOV 2015 MEETING

- UNANIMOUS AGREEMENT BY STAKEHOLDERS FOR INITIATING IMPLEMENTATION OF SOLAR THERMAL IN DAIRIES.
- MNRE, UNDP EXTENDED FINANCIAL SUPPORT FOR SPEEDY, IMPLEMENTATION OF SOLAR THERMAL SYSTEMS

## IMPORTANT DECISIONS



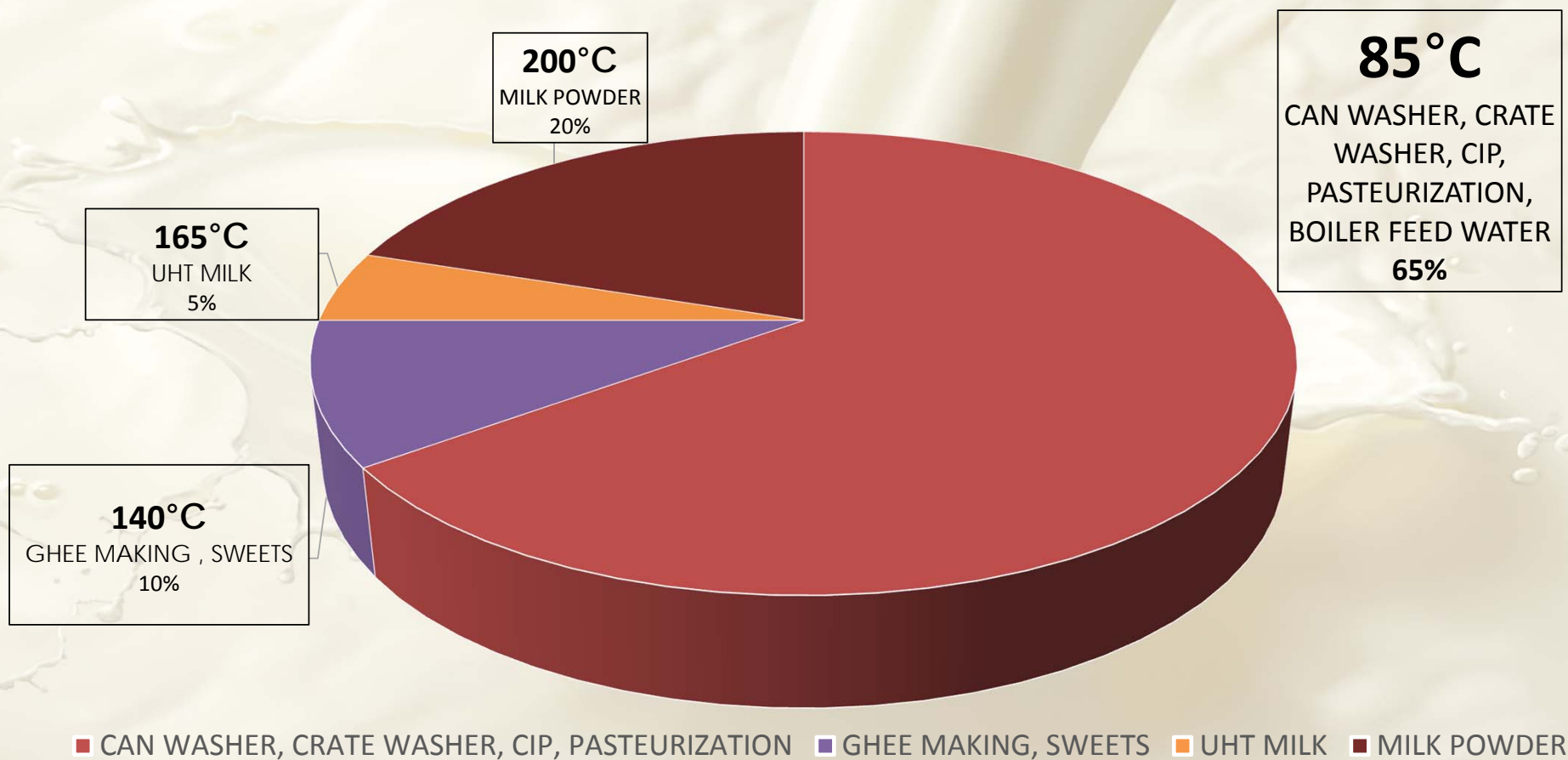
- WHETHER THERMAL ENERGY DELIVERY IS REQUIRED IN THE FORM OF HOT WATER OR STEAM.
- HOW TO MAKE THE SYSTEM COST EFFECTIVE & COMMERCIALY VIABLE





# THERMAL USAGE PATTERN IN DAIRIES

## STEAM UTILIZATION





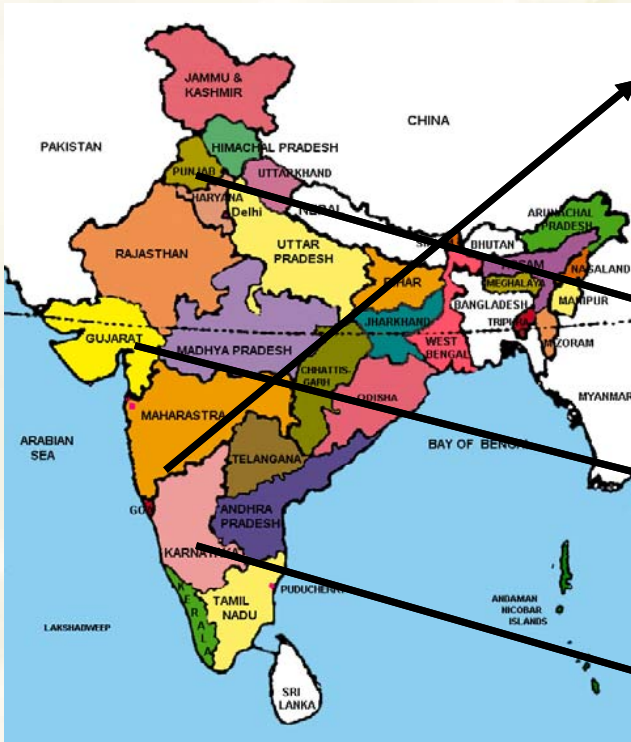
# CST IMPLEMENTATION ACHIEVEMENTS

- 15 CST PROJECTS IMPLEMENTED IN DEC 2017, FOR A TOTAL HEAT GENERATION OF 1,80,000 KCAL/DAY
- INSTALLED 7800m<sup>2</sup> OF CONCENTRATOR APERTURE AREA
- TOTAL PROJECT INVESTMENT ~ INR 16 CRORES.
- ANNUAL FURNACE OIL SAVINGS EQUIVALENT OF 678 MT OR EQUIVALENT CO<sub>2</sub> EMISSION REDUCTION OF 2488 MT/ANNUM
- REDUCTION BETWEEN 5 -15% OF FUEL EXPENDITURE DUE REPLACEMENT WITH SOLAR THERMAL (ON YEARLY AVERAGE).
- EXECUTED PROJECTS ON PRO-BONO BASIS.



# PROJECTS DETAILS

Location	Total Aperture Area	Total project estimate	Approx. subsidy	Investment	Expected Payback
Kolhapur (6 projects)	2700 m <sup>2</sup>	INR 6.23 Crores	INR 1.6 Crores	INR 4.62 Crores	4– 5 years ( FO as fuel)
Punjab (1 project)	2450 m <sup>2</sup>	INR 5.32 Crores	INR 1.47 Crores	INR 3.85 Crores	4– 5 years ( FO as fuel)
Gujarat (1 project)	380 m <sup>2</sup>	INR 93 Lakhs	INR 38 Lakhs	INR 55 Lakhs	4 – 5 years ( FO as fuel)
Karnataka (3 projects)	2250 m <sup>2</sup>	INR 4.92 Crores	INR 1.57 Crores	INR 3.35 Crores	4 – 5 years ( FO as fuel)



NOTE : FO COST @ 36/LITRE



# CST PROJECTS IN KOLHAPUR DISTRICT

**CHANDGADH (5L KCAL/DAY)**



**GOGAVE (5L KCAL/DAY)**



**BIDRI (5L KCAL/DAY)**



**GADHINGLAJ (5L KCAL/DAY)**



**SHIROL SATELLITE (10L KCAL/DAY)**



**GOKUL DAIRY (30L KCAL/DAY)**







# CST PROJECTS IN KARNATAKA

**BANGALORE (5L KCAL/DAY)**



**BIJAPUR (5L KCAL/DAY)**



**BALLARI (9L KCAL/DAY)**



**BANGALORE (20L KCAL/DAY)**





# CST PROJECTS IN PUNJAB

**MOHALI (15L KCAL/DAY)**



**JALANDHAR (15L KCAL/DAY)**



**LUDHIANA (25L KCAL/DAY)**







# CASE STUDY OF 5 LAKH KCal/DAY CST INSTALLATION

**FURNACE OIL CONSUMPTION (PRIOR TO CST) : ~ 320 LITRES/DAY**



## RESULTS OF 15 DAYS PERFORMANCE

**AVERAGE HEAT DELIVERY : 5,80,000 KCal/day**

**RECORDED FURNACE OIL SAVING : (80 – 100 LITRES/DAY)~ Rs. 3000/Day**

**INSTALLATION AT CHANDGADH CHILLING CENTRE (KOLHAPUR)**



# NEW CST INSTALLATION

**14 LAKH KCAL/DAY CST SYSTEM AT UPPOOR DAIRY, UDUPI, KARNATAHA**



**SOLAR FIELD**



**THERMAL STORAGE TANK**



**PLATE HEAT EXCHANGER**

**(READY FOR COMMISSIONING)**





# FUTURE OF IMPLEMENTATION

- SMALL & MEDIUM SIZE DAIRY UNITS MADE AWARE OF THE BENEFITS OF HARNESSING SOLAR ENERGY.
- INTEGRAL PART OF ALL PROJECTS BEING IMPLEMENTED I.E. GREENFIELD OR BROWNFIELD.
- POTENTIAL OF IMPLEMENTING MORE THAN 350 INSTALLATION IN SMALL & MEDIUM SIZE.

## CONSTRAINTS

- BRING DOWN THE COST OF THE CONCENTRATING TECHNOLOGY.
- LIMITED OPTIONS AND NO/FEW CONCENTRATING TECHNOLOGY MANUFACTURERS IN INDIA.
- CONFIDENCE ON TECHNOLOGY TO CONSISTENTLY DELIVER THERMAL ENERGY.



THANK  
YOU