



**Research on awareness
about solar thermal energy
in the dairy industry**

(An initiative from Clique Solar to support the
Solar Thermal Industry)



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Summary

India's leadership in dairy production is unquestionable. It is the largest milk producing country in the world with the present level of annual milk production estimated at 100 million tones. (ComSolar Report 2011)

100 million tones means a lot of things. It means leadership, economy, livelihoods, society, energy and environment to name a few things.

It also means a great opportunity and hope for the renewable energy industry especially solar thermal industry. The industry utilizes a substantial amount of thermal (heat) energy for milk processing (pasteurization, sterilization, spray drying, evaporation, etc.), which can be provided through solar energy.

'Solar thermal systems can enormously contribute to driving the various thermal processes in the dairy industry which demand water at temperatures less than 120°C. Apart from this, solar PV systems can also contribute to saving electrical energy consumed during refrigeration. Table 25 shows the mapping of various dairy processes along with different solar technologies that can be potentially used.' (ComSolar Report 2011)

However, the opportunity and the potential needs to be converted into reality. The trend as of now is not very encouraging. Awareness about CST technologies is a huge issue. More harmful than non-awareness is the misconception that people have about the CST industry.

Added to the misery of the CST technology manufacturers is the lack of awareness and understanding amidst the manufacturers' community on what are the challenges that are acting as hurdles in adoption of CST technologies by the dairy owners.

There is only one way to get insights and clarity on the subject. I.e. go to the dairy owners and connect with the dairy owners.

Clique Solar, thus, initiated a research exercise with the dairy industry and is now ready with its report. The report has vindicated some existing thoughts, challenged a few and thrown a few insights that might be of great help if the CST industry wants to reach out to the stake holders.

A gist is given ahead..



- The report highlights that there is a huge latent demand which is lying dormant due to awareness challenge. Dairy owners across geographies are unaware that their thermal heat requirements can be tackled by solar thermal technologies. They don't have a complete understanding about the solar thermal technologies.
- FPCs, ETCs and PV technology are well known and clear amongst the people who use them. Unfortunately, respondents did club FPCs and ETCs with solar concentrator technologies.
- Cooperatives and private dairies showed equal enthusiasm for participation in the research survey.
- Dairy is a sector where a majority of heat requirements can be fulfilled by renewable energy. Unfortunately, only 9 percent of respondents say that they are using renewable energy to fulfill more than 20 of their heat requirements.
- All the respondents are information hungry. They have heard about renewable energy, especially solar energy) but very little is known on how it can be beneficial for them.
- Over 51% of the respondents use Furnace Oil or Diesel to fulfill their energy requirements. Renewable energy has a huge role to play in reducing their fuel bills.
- Of the 31 percent who have renewable energy installations, 75% said they will like to go for more.
- About 81% of the plant owners view solar energy systems in a favourable manner. Green philosophy and economics have emerged as important factors for favourability. Cooperatives sensitivity towards green philosophy is high.
- Internet has emerged as an important medium for information for private as well as cooperatives. This is an encouraging development. However it is important to know more about the usage on how can dairies be reached to these people.
- Reasons for non-favourability include space constraints and poor economics.

Introduction

Background

India is the largest milk producing country in the World (ComSolar Report 2011).

India is also one of the few countries in the World that has embarked on an ambitious journey of adopting renewable energy, thus leading the switch from non-renewable energy to sources of renewable energy, saving environment and reducing dependency on traditional fuels.

This journey towards achieving renewable energy self sufficiency cannot be uni-directional. There are a number of technologies and ways in which energy requirements can be fulfilled. Like wind energy, hydro energy, PV, solar thermal energy including others. Also, not all energy requirements exist in the same form.

Some require electricity while some require heat. This is where the awareness and understanding is required amongst all the stakeholders that are part of this journey, including the end users, media, manufacturers, the financing companies, people etc.

This awareness and understanding amongst the stakeholders will increase only through the dialogues and discussions. There are many tools and one of such tools is research. Clique Solar, as mentioned in this document earlier, has been and will keep contributing towards strengthening the CST industry through dialogues, highlighting issues and bringing awareness amongst the stakeholders.

Choice of Industry

The research and the choice of the industry has been inspired by the following key factors –

1. MNRE and GIZ report titled - Identification of Industrial Sectors Promising for Commercialisation of Solar Energy. The report came out with top potential sectors out of which the dairy sector was chosen.
2. The experience and the performance case studies in the sector.
3. The energy consumption in the form of heat energy and the percentage of it that can be fulfilled by a CST technology - dairy sector scores high in this regard

Dairy industry can be a great beneficiary of Solar Thermal technologies. The technologies are there, the case studies are there, the expertise is there, but still adoption and demand for CST technologies lags in the dairy industry. To find out the reason, a research with the Dairy owners was conducted where we reached out to the dairy owners from different states.

Approach and Methodology of the study

Type of research – Primary research

Approach - A qualitative research based on a one-on-one survey with the dairy owners. The owners were asked objective type questions with a couple of subjective questions. The emphasis on objective type questions was made so that variance in responses is minimum. Of course, the respondents had the option of adding if they were not satisfied with the options provided.

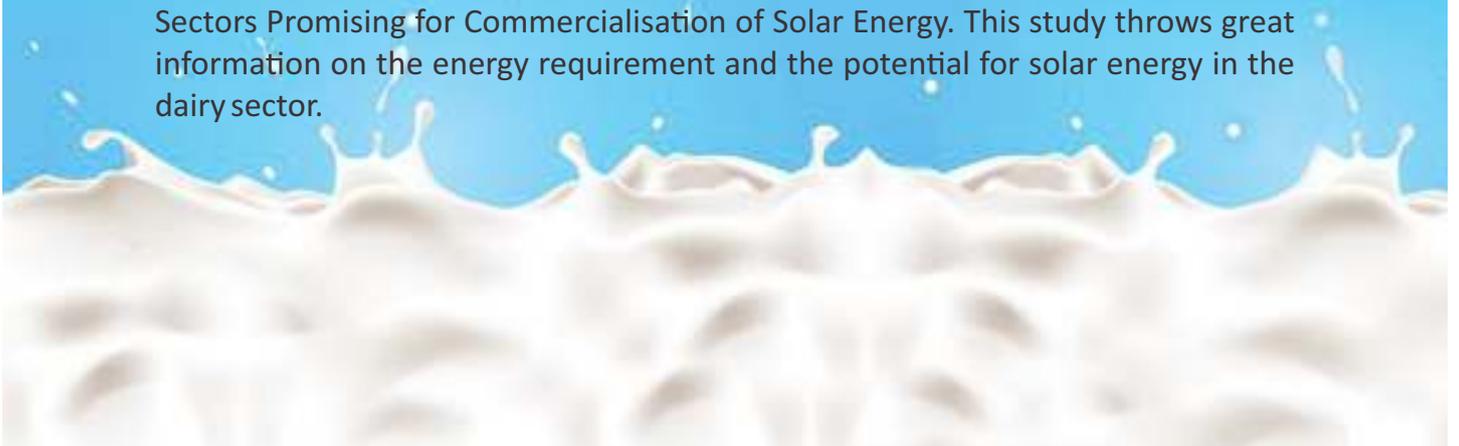
Methodology

- A questionnaire was drafted and finalized. Since the survey was conducted to understand the dairy industry from the CST industry's perspective, almost all the questions were directed to get a dairy owners' understanding for the CST industry
- Once the questionnaire was finalized, the dairy owners were approached for a quick one to one survey
- The survey results were collated and analyzed. Results and learning are documented in the report
- Preparation of recommendation report for the CST manufacturers group and the policy making bodies including MNRE etc.

The objective of the study

- To gauge the understanding of dairy owners
 - on renewable energy, if they have adopted it
 - if they view solar thermal technologies beneficial to them
 - if yes, then why and if no, then why
 - how to reach out to them

The idea definitely is not to repeat the research or the study that has already been undertaken by MNRE and GIZ in their report titled - Identification of Industrial Sectors Promising for Commercialisation of Solar Energy. This study throws great information on the energy requirement and the potential for solar energy in the dairy sector.



Recommendations for the industry / MNRE / CST Manufacturers group

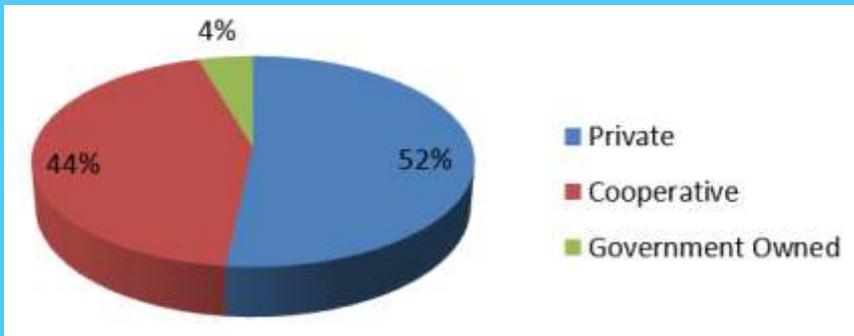
- **CST doesn't exist in the priority** - 'CST technologies' is a phenomenon that is not more than 5 to 7 years old. In the period the businesses have grown multifold and challenges are immense. Amidst all these challenges and opportunities the focus is on keeping the plant or the organization going. Couple it with the challenge of 'non-awareness' and 'no urgency to have the awareness', indication is to create an environment that brings adoption of renewable technologies on priority.
- **Consistency is the key** - Creating an environment of priority will take time. Hence, consistency is the key. This also means that those channels should be chosen that ensure wider reach, consistent reach, are trusted by the dairy owners community and are cost effective. Only one channel will not be that effective.
- **Convince the key stakeholders** - Every industry has formal bodies and people who are followed and respected widely. It is imperative that these bodies should be reached out to, informed, educated about the vision of MNRE and ways of collaboration should be chalked out. This will aid MNRE substantially.
- **Case Studies** - Nothing succeeds like success. The research suggests that no one in the dairy industry is aware of successful installations. Bad news travels fast and finds easy acceptance while good news finds slow acceptance. To tackle the misunderstanding or non-awareness, it is imperative that success stories are shared extensively.
- **Awareness is the key** - The Dairy sector needs to be sensitized to the basic education on how renewable energy is the need of the hour and how actually it will benefit them. We need to address the doubts that are fueling their inertia.

Deep dive in the industry - CST technologies are applicable in a wide range of industries and has a huge audience to cover. The audience is geographically spread, speaks different languages, difficult to reach in one go and has people with varying educational backgrounds. Same is true with the Dairy industry. This indicates that if we need to take the message of CST adoption to the owners of dairies, we need to dive deep and churn out regular campaigns. To address the challenge it is recommended that MNRE needs to collaborate with National Dairy Development Board.

Analysis

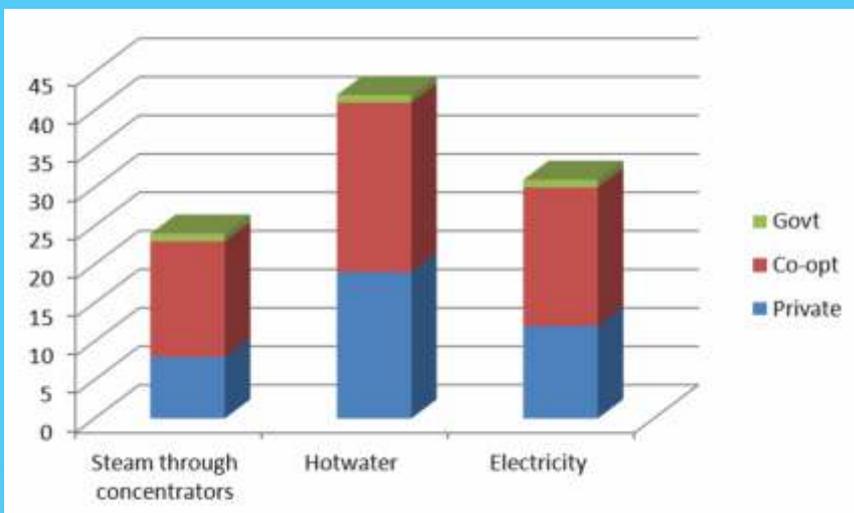


The constitution of dairies?



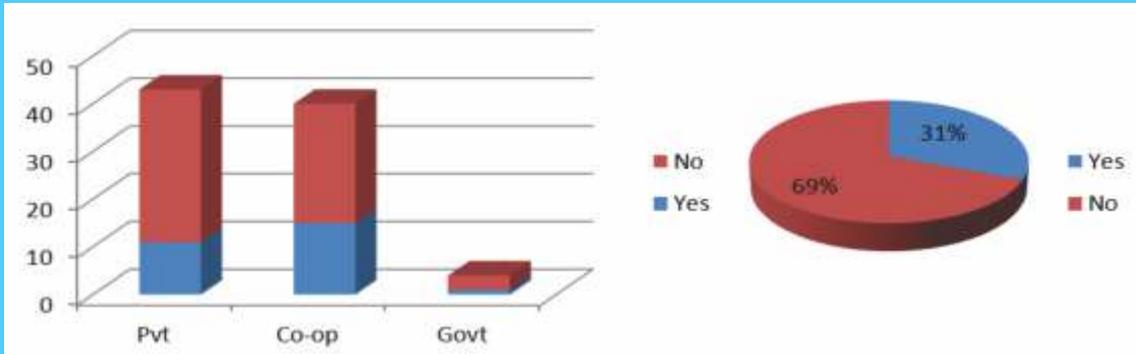
Dairy sector now consists of a good number of private and cooperatives. The survey points to extensive presence these two types of organizations. The two have almost equal representation in the sector as far as the survey is concerned. Knowing that the number of co-operatives are substantially more in number than private dairies, the survey shows that the number of private dairy owners are more eager to participate in such an exercise if conducted

Q1) Are you aware of any of the following applications of solar technology in the dairy industry



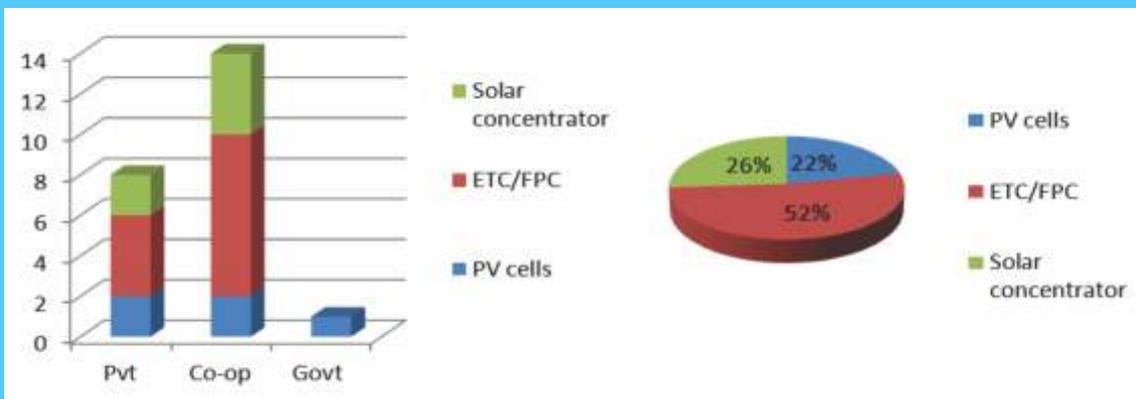
- Hot water installations is what a lot of people know about
- While the research points that a lot of dairies know of solar concentrators, our estimate is that the information is misled and confused with other solar thermal technologies like ETC and FPC
- Cooperatives lead the awareness on solar energy technologies

Q.2) Number of dairies that have chosen to implement renewable energy based systems?



- 31% when just looked as a figure definitely seems to be low. However, from the renewable energy industry's perspective this is a welcome figure.
- Cooperatives have surprised by having an edge over their private counter parts
- This doesn't indicate the size or the energy requirement fulfilled of the favourable respondents

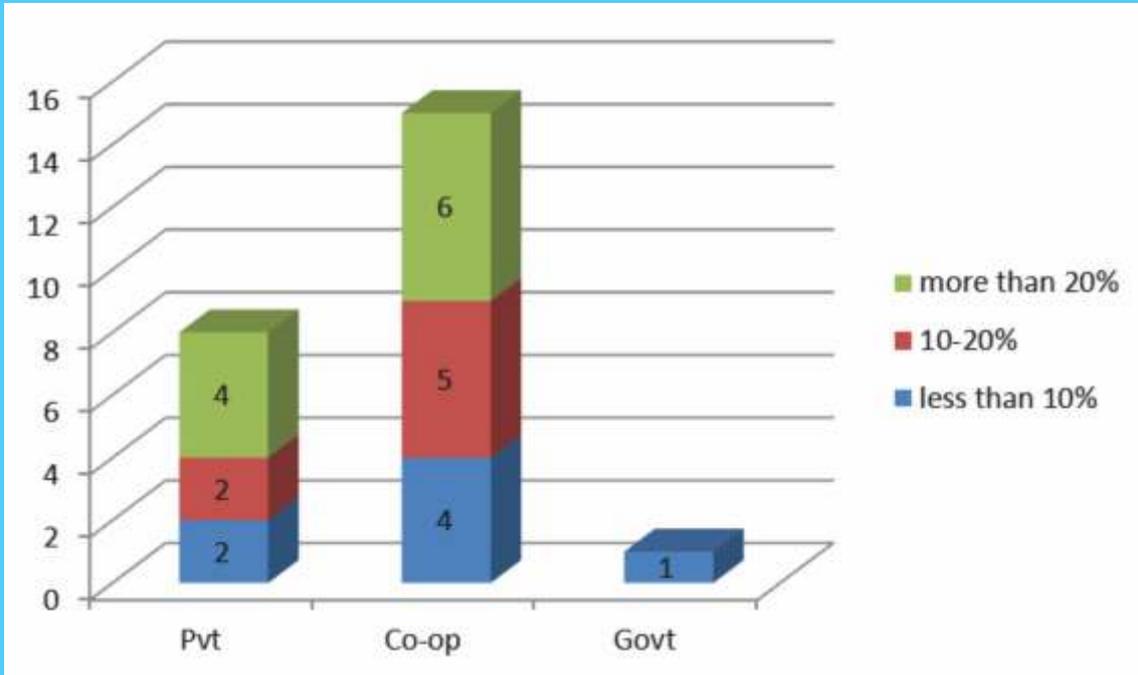
Q.3) What is the renewable energy source that has been used by the dairy?



of the people who said yes in the above question,

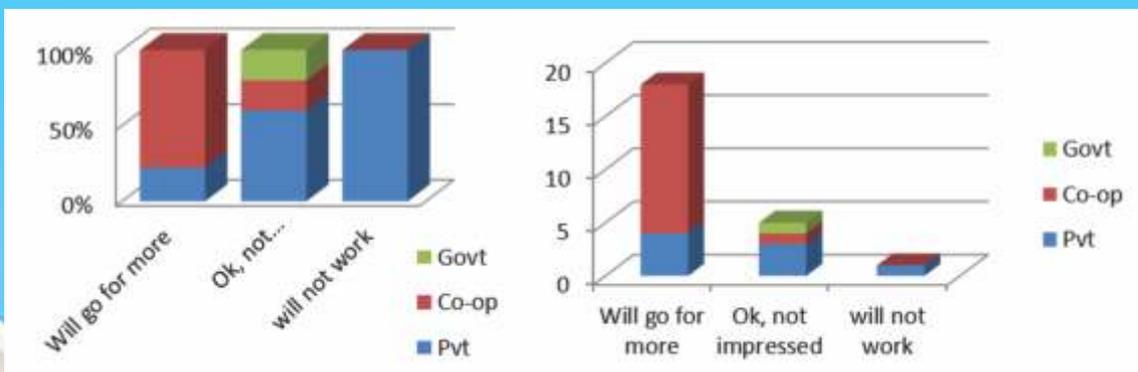
- Cooperatives clearly have an edge when it comes to adoption of solar technologies
- Solar concentrators have gained more votes as compared to PV. However we don't have enough case studies to show that Solar Concentrators installation in cases studies. This only means two things – either people don't understand what are solar concentrators or the CST industry is not doing a great job in highlighting the success of CST technologies.
- Government entities are almost nowhere in the picture
- If any marketing activity has to start, it should start with the co-operatives
- One person said Bio gas

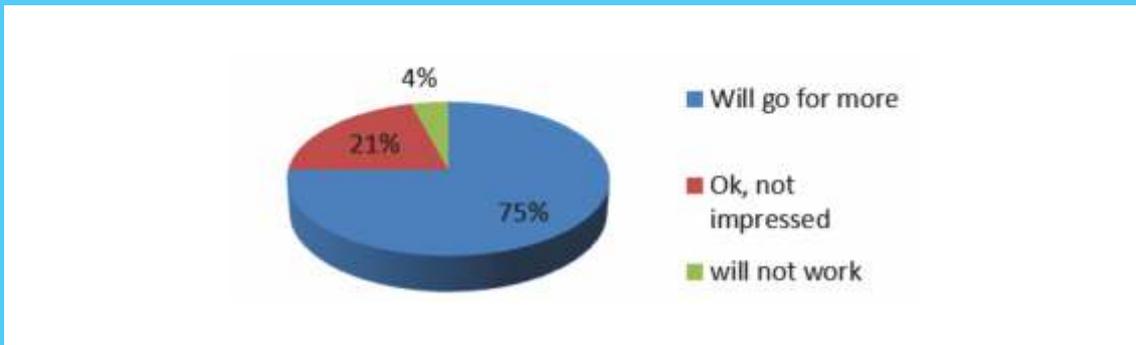
Q. 4) What percentage of energy requirement is fulfilled by the renewable energy sources?



- Again an encouraging indication that 'more than 20% options' has received the maximum response. This is out of the 31% who have adopted the solar energy systems.
- The industry already has early adopters and their experience should be recorded to make a case for adoption by others
- Cooperatives continue to lead the trend of renewable energy adoption. The trend continues.

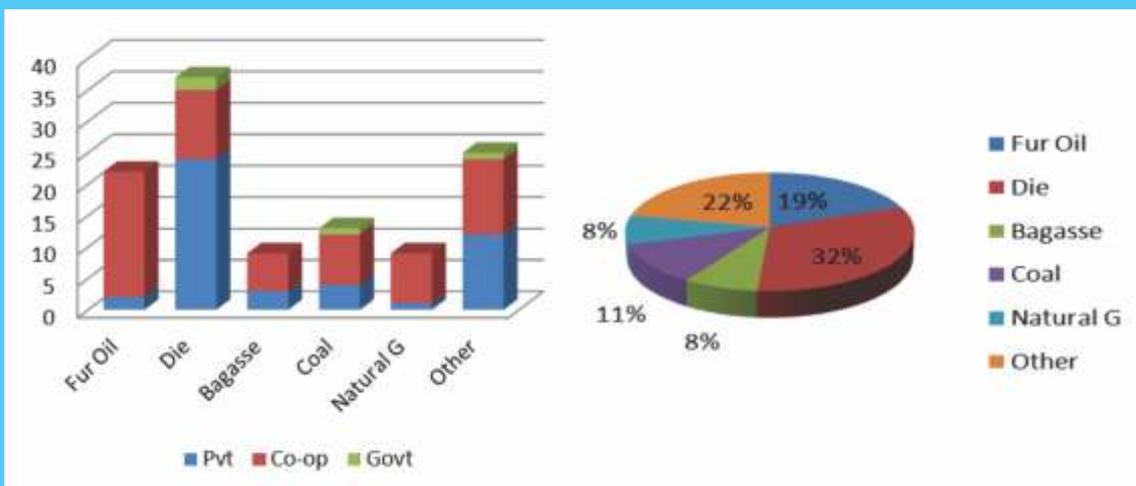
Q.5) How has your experience been with the renewable energy system?





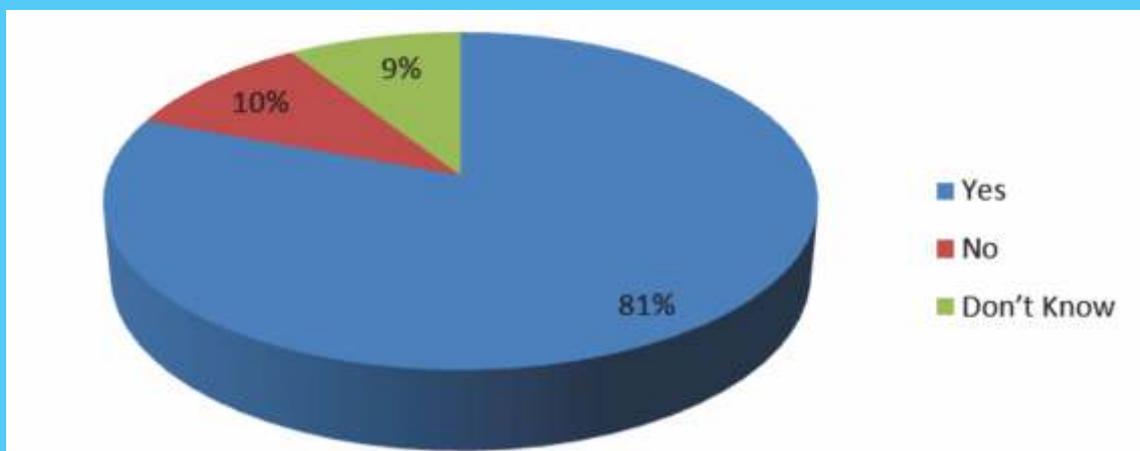
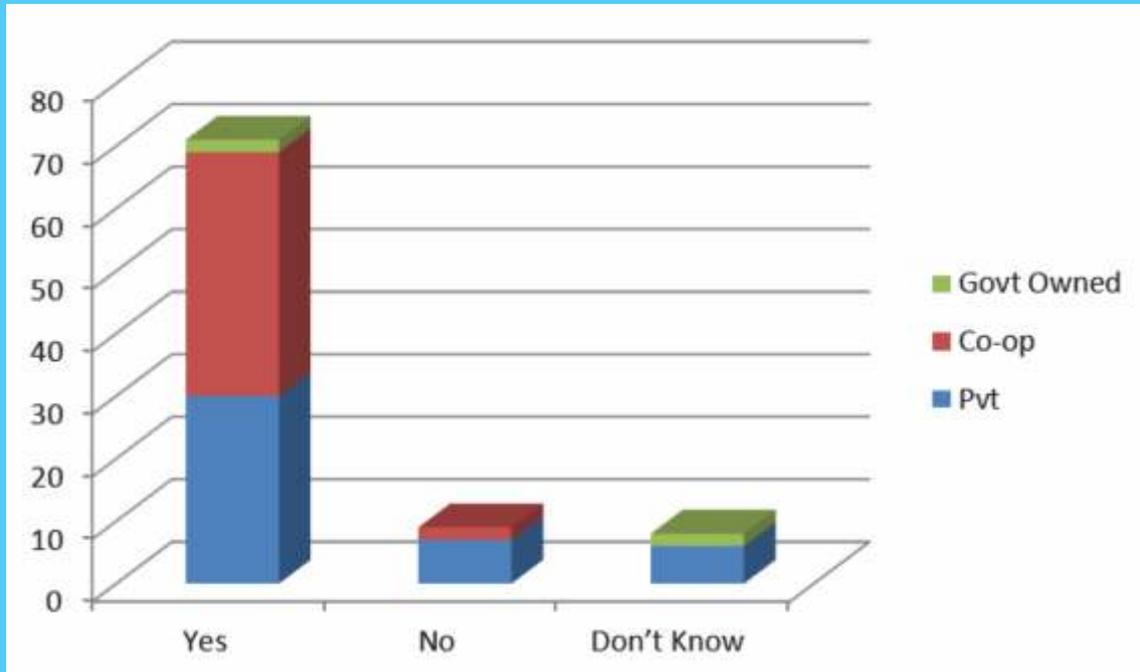
- 75% of existing users would like to upgrade or strengthen their solar system installations
- Private parties don't have a great impression. The reasons behind should be understood by engaging with them closely.
- Their success stories should be documented.

Q.6) Which fuels are used for thermal energy requirement currently in the dairies?



- The current energy equation is working highly in favour of CST. Around 51% of dairies use liquid fuels like diesel and furnace oil.
- Dairies using liquid fuels can save large amount of operating cost as well as precious conventional fuels if they adopt CST.
- This indicates a huge scope for CST technologies provided awareness is addressed.
- This can make a great economic case for CST in favour of the dairy industry.

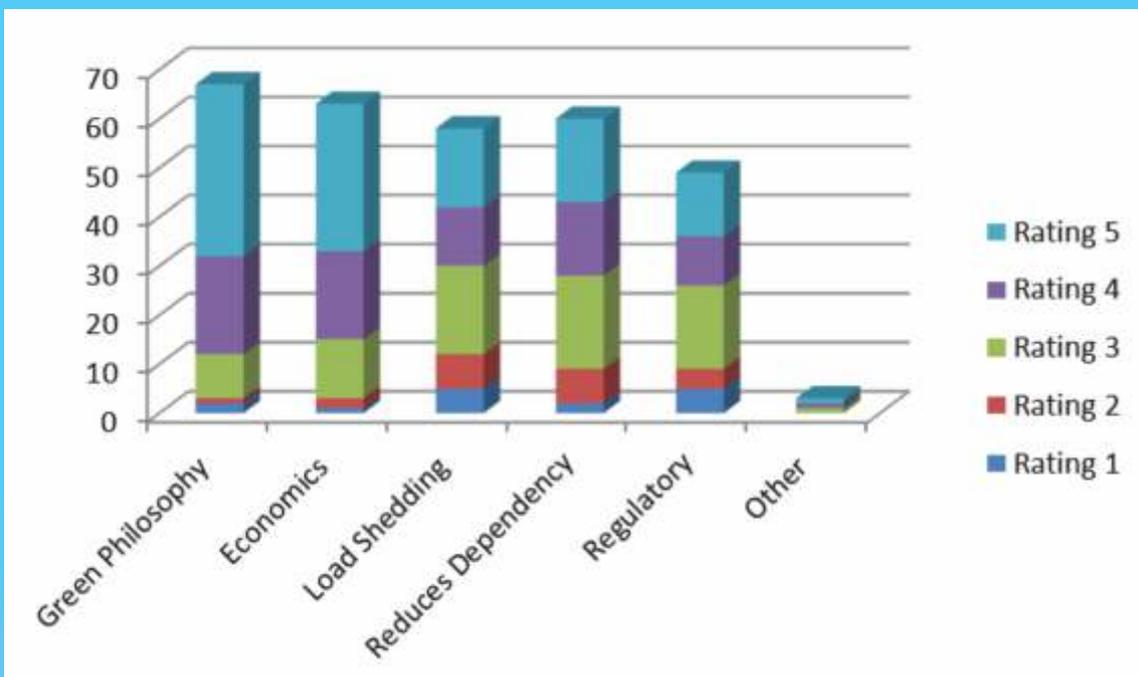
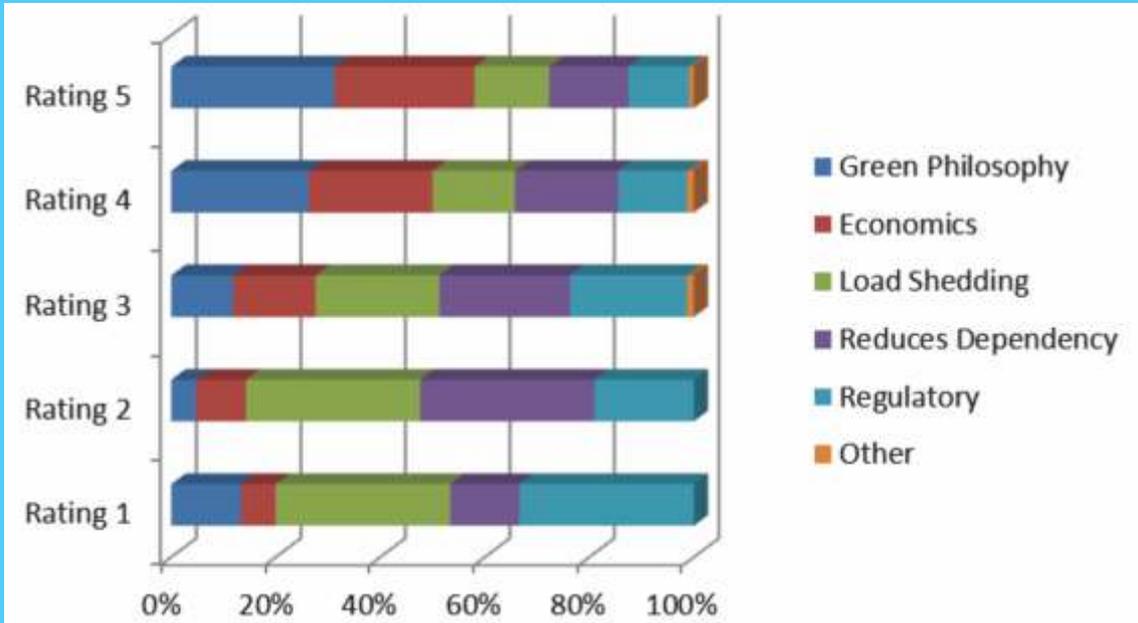
Q.7) Does your dairy keep a favorable view of solar energy in terms of its applicability in your organization?)



- The interest level is high – 81 percent is in favour of knowing more about it
- Cooperatives again lead the way

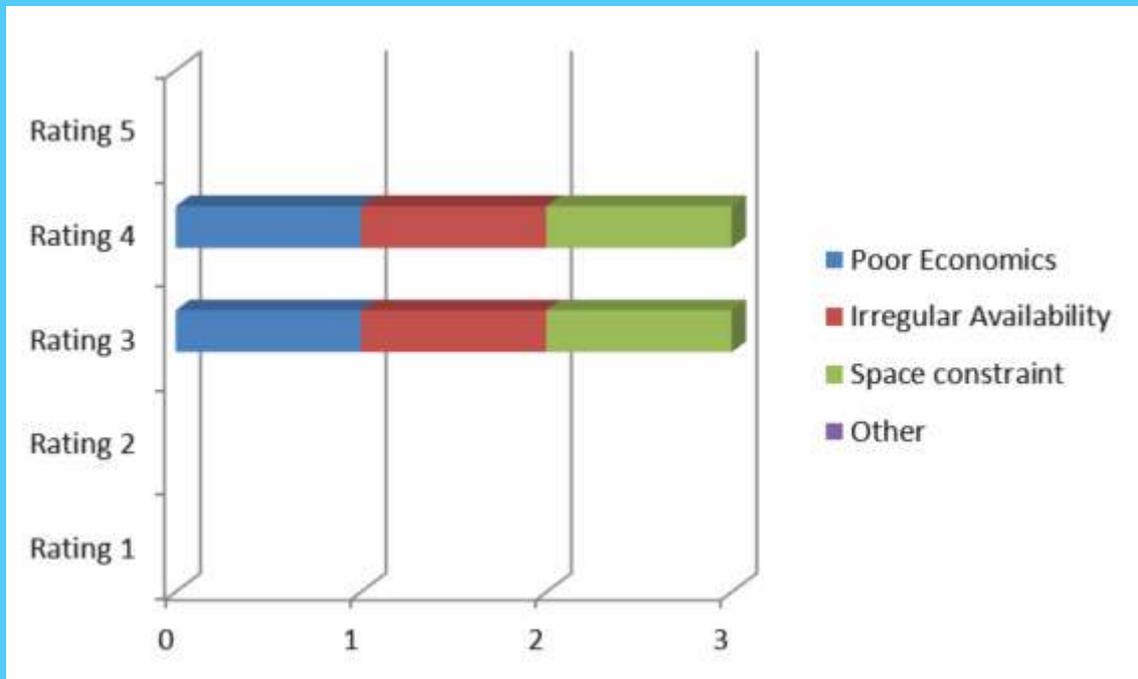


**Q.8) What is the reason behind the favourable or the non-favourable view?
(Rating 5 is indicates most important while Rating 1 is least important)**



- Green philosophy and economics are the major drivers for adoption of renewable energy technologies
- Load shedding, Fuel dependency and regulatory requirement are not the compelling factors. It also indicates that getting fuel is not an issue, price is. Especially when a good 51% are using liquid fuels.

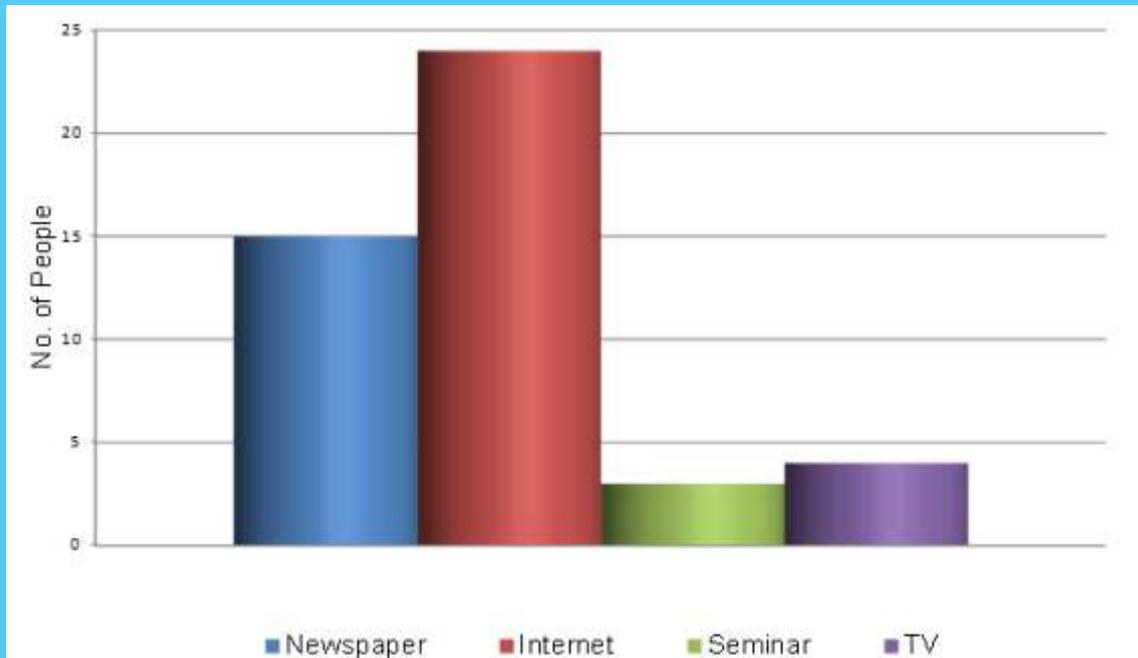
NON-FAVORABLE



- There are a very few people who keep an unfavourable view.
- It is however unclear what makes them have a non-favourable opinion. It indicates more of confusion than clear inclination



Q.9) Where do you get your information on renewable energy from?



- Internet and Newspapers are the primary mode of gaining information for the dairy owners.
- Chances are also that not many seminars are being organized on the renewable energy for the dairy industry.



