KEC 2012

ENERGY FOR AGRICUTURE IN A SUSTAINABLE SCENARIO

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Formerly,

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- THE RECENT BLACK OUT IN NORTH INDIA SHOULD BE AN EYE OPENER
- MANY OBSERVERS ARE OF OPINION THAT THIS WAS CAUSED BY GRID INDISCIPLINE ON THE PART OF SOME STATES
- ALL OF THEM ARE PREDOMINANTLY AGRICUTURAL STATES WHICH HAVE LARGE PROPORTION OF AGRICUTURAL LOAD

- THE EXTENDED DROUGHT AND FAILURE OF MONSOON CAUSED A HEAVY PUMPING LOAD
- THIS COULD NOT BE IGNORED BY THE GOVERNMENT
- INTERESTINGLY, THE IRRIGATION PUMPING LOAD IS COINCIDENT WITH INCIDENT SOLAR ENERGY
- IF THE DROUGHT LASTS LONGER, MORE SOLAR ENERGY WILL BE AVAILABLE

THE SITUATION IS TAILOR-MADE FOR SOLAR ENERGY UTILIZATION IN A LARGE WAY

IN A PRESENTATION MADE IN THE LAST KEC, I SAID:

- **CURRENT COST OF PV CELLS IS $3.5 PER Wp**
- **THIS HAS TO COME DOWN TO $1 PER Wp TO MAKE IT COMPETITIVE**
- **(OR, THE COST OF OIL HAS TO GO UP!)**
- **THERE ARE INDICATIONS THAT BOTH ARE ALREADY HAPPENING !**

IT HAS HAPPENED!

- THE PRICE OF SOLAR PANELS HAVE CRASHED TO LESS THAN $1 /Wp IN THE INTERNATIONAL MARKET
- IN THE SECOND ROUND OF BIDDING IN THE JN NATIONAL SOALR ENERGY MISSION, THE LOWEST RATE QUOTED WAS Rs 7.49/KWH FOR RAJASTHAN
- GUJARAT HAS RECENTLY COMMISSIONED A SOLAR FARM OF 600 MW CAPACITY

- **THERE IS A RESURGENCE IN SOLAR PV WORLDWIDE**
- **GERMANY HAS CONNECTED 28000 MW TO THE GRID FROM SOLAR PV INSTALLATIONS**
- **CALIFORNIA IS PROCEEDING WITH ONE MILLION SOLAR HOMES PROJECT – ROOF TOP SOLAR PV SYSTEMS CONNECTED TO THE GRID – WITH NET METERING**

CAN KERALA HAVE A SUATAINABLE ENERGY SCENARIO WITH SOLAR PV AS THE MAJOR INPUT?

- **KERALA HAS REASONABLE HYDEL RESOURCES,**

  ESTIMATED TO BE ABOUT 3000 MW
- **PRESENT INSTALLED CAPACITY IS 1933 MW, CONTRIBUTING ABOUT 6000 MU / YR.**

  ANOTHER 280 MW (822 MU) IS IN PIPE LINE.
- **KSEB HAS SOME MORE PROPOSALS,**

  BUT MOST ARE MIRED IN CONTROVERSIES, HAVING UNACCEPTABLE ENVIRONMENTAL IMPACT.

- **CONSUMPTION FOR 2010 WAS 17335 MU, WITH A PEAK DEMAND OF ABOUT 2800 MW**

- **THAT MEANS ABOUT TWO THIRDS OF OUR ELECTRICITY IS PURCHASED FROM CENTRAL PLANTS OR OTHER SEBs OR IPPs – MOST OF IT COMING FROM NON RENEWABLE SOURCES.**

- **AND OUR DEMAND IS GROWING!!!**

- **THIS IS CLEARLY UNSUSTAINABLE !**

- **A SUSTAINABLE ENEGY SCENARIO CAN ONLY BE BASED ON SOLAR AND ITS DERIVATIVES,**

  LIKE WIND, WAVE OR BIOMASS,

  AND OF COURSE, HYDEL, TO THE EXTENT IT IS ACCEPTABLE FROM ENVIRONMENTAL CONSIDERATIONS

SOLAR PV

ADVANTAGES:

- **NO MOVING PARTS, DIRECT CONVERSION TO ELECTRICITY.**
- **ONLY ELECTRONIC COMPONENTS: LIKELIHOOD OF DRAMATIC COST REDUCTION VERY HIGH.**
- **CAN ACCEPT DIFFUSED RADIATION ALSO, NO TRACKING REQUIRED.**
- **AMENABLE TO DECENTRALIZED POWER GENERATION.**

Olmedilla Photovoltaic Park, 60 MWp

An installation in Germany

Tata Power plans India’s largest solar PV installation(50MW) in Gujarat

DECENTRALIZED GENERATION

- **ONE EXCITING POSSIBILITY OF SPV IS THAT IT IS AMENABLE TO DECENTRALIZED GENERATION**
- **CALIFORNIA HAS LAUNCHED A PROJECT CALLED ONE MILLION SOLAR ROOFS, TO EQUIP 1 M HOUSES WITH ROOF TOP SOLAR PV ARRAYS**
- **THEY ARE GRID CONNECTED, AND HOME OWNER HAS TO PAY ONLY FOR THE EXCESS ENERGY CONSUMED**

House top Mounted SPV

AT KEC 2011, I SAID:

IF THIS CLAIM IS TRUE,

THE SOLAR ERA IS HERE!

KERALA HAS TO PLAN NOW

FOR THE ARRIVAL OF SOLAR PANELS AT $1 PER Wp

- **DEFINITELY, HOUSE TOP MOUNTED DECENTRALIZED POWER GENERATION, CONNECTED TO THE GRID THROUGH DIFFERENTIAL METERING, IS AN OPTION.**
- **BUT EQUALLY IMPORTANT IS CENTRALIZED GENERATION TO FEED DIRECTLY INTO THE GRID**

CAN WE DO IT IN IDUKKI?

- **IDUKKI RESERVOIR HAS A SURFACE AREA OF 60 SQ KM OR 60 MILLION SQ M**
- **THE SOLAR ENERGY FALLING ON THIS SURFACE IS @ 60 million kW**
- **OR 60,000 MW**
- **IF WE FILL ONLY A THIRD OF THE SURFACE AREA WITH SPV PANELS HAVING 10% EFFICIENCY, THE YIELD WILL BE 2,000 MW**

“Floto Voltaic”?

- An Italian company is currently exploring the potential of using expanses of water to host solar power systems. Scienza Industria Tecnologia is developing the Floating Tracking Cooling Concentrator (FTCC) System; created for use on lakes and small basins.

- **THE ADVANTAGE OF FLOATING SOLAR PANELS IS THAT THEY CAN EASILY BE TILTED TO TRACK THE SUN**
- **SO AS TO ENHANCE THE EFFICIENCY BY AT LEAST 10%**

CAN WE DO IT INIDUKKI OR PEPPARA OR MALAMPUZHA?

PRIORITY

- **PILOT PLANTS TO BE ESTABLISHED AND FEASIBLITY TO BE STUDIED**
- **WILL WE DO IT?**

THANK YOU!