



## JOIN THE CENTURY OF SOLAR

A Year of Virtual Celebration

### **SWC50-The Century of Solar Celebration** *Newsletter – April 2021*

This month we provide

- A brief overview of solar research and applications in the 1960's; and
- A focus on China.

The overview of solar in the 1960's provides some key highlights taken from the booklet:

[ISES SWC50 The Century of Solar Stories and Vision Booklet](#)

For more highlights, please refer to the booklet or the [ISES Solar Energy Museum – Past, Present and Future](#)

#### **ISES 1960's**

Significant events in the history of ISES in the 1960's include:

- In 1960 the Association for Applied Solar Energy (AFASE) moved to Arizona State University (ASU) - donated offices; Hal Walmsley became President; Milton Lowenstein, the AFASE librarian; Prof. A. B. Stafford, *Solar Energy* editor; and S. W. Wilcox, *Sun at Work*. Editor.
- In 1963 AFASE's name was changed to the **SOLAR ENERGY SOCIETY** (SES) and it was accredited by the United Nations Economic and Social Council
- The Italy section was formed in 1964 and India section formed in 1967.

#### **AFASE AND SES Presidents in the 1960's**

| <b>Years</b> | <b>President</b> | <b>Country</b> |
|--------------|------------------|----------------|
| 1960-63      | H. Walmsley      | USA            |
| 1964-67      | F Daniels        | USA            |
| 1967-69      | P.E Glasser      | USA            |
| 1969-1970    | R.N. Morse       | Australia      |

#### **What is SWC50 – The Century of Solar?**

In 1970 solar research pioneers met at the first International Solar Energy Society (ISES) Conference in Melbourne Australia. ISES is commemorating this first Solar World Conference with a special 50th Anniversary Virtual Conference, called the Solar World Congress at 50 (SWC50).

During these past 50 years solar energy has grown from being emerging technologies to a vibrant industry. The Century of Solar highlights the transformation in the global energy sector that has taken place since the first Solar World Congress in 1970 and looks forward to the next 50 years when solar energy will be a major cornerstone of the global energy system. While the focus of the Century of Solar is on the evolution of solar energy, the importance of other renewable energy sources working together to reach the 100% renewable energy world goal will be a central theme.

**SWC50 - The Century of Solar** is about the people: researchers, industry players, policy makers, and leaders of NGOs and Non-profit organizations who have all contributed to make solar energy the fastest growing contributor to new electricity capacity.

**SWC50 Programme:** The SWC50 virtual conference was held on 3 - 4 December 2020, with two follow up webinars due in 2021.

### *Conferences and Meetings 1965-1968*

| <b>Year</b> | <b>Location</b>  | <b>Overview</b>   |
|-------------|------------------|---|
| 1965        | Phoenix<br>USA   | Annual Meeting of SES<br>Approx. 50 papers, 110 in attendance   |
| 1966        | Boston<br>USA    | Second Annual meeting SES<br>conference Approx. 43 papers   |
| 1967        | Tempe<br>USA     | <i>Industrial Aspects of Solar Energy</i><br>General Chair: Peter E. Glaser<br>Approx. 100 in Attendance. |
| 1968        | Palo Alto<br>USA | 4 <sup>th</sup> Annual Meeting of SES<br>General; Chair" W.B. Gibson                                      |

#### *Photovoltaics' 1960's*

Significant events in the history of PV in the 1960's include:

- In June 1960 the US Army Signal Corp demonstrated the first coast to coast two-way radio signal powered by solar. It was from the corps station at Ft Monmouth New Jersey to El Monet, California headquarters of **Hoffman Electronics**.
- In 1962 **Bell Telephone Laboratories** launched the first telecommunications satellite, the Telstar (initial power 14 watts).
- The **Sharp Corporation** installed a solar powered buoy in Yokohama Bay, Japan in 1963 and a 225 watt, photovoltaic array (world's largest array at that time) on a lighthouse on Ogami Island, Japan in 1966.

Telecommunications and marine navigational devices became the early terrestrial markets for PV.

#### *Solar Thermal 1960's*

Solar water heater development and production continued to grow and work on standards along with interesting pilot projects were undertaken.:

- In 1965 a Solar water heater test centre set up at the University of NSW, Australia by Charles Sapsford. The Centre was later used by Graham Morrison to develop testing procedures that became the basis of many Australian and International Standards and the TRNAUS extension to TRNSYS that covers Thermosyphon water heaters.
- In 1966 the world's largest solar still built at Coober Pedy Australia, to convert saline bore water to fresh water for the town's residents. The still was based on a prototype which the CSIRO Division of Mechanical Engineering had been operating successfully at Muresk Agricultural College in Western Australia since 1964, under the guidance of Wal Read. (ISES President 1983-85)

For more highlights, please refer to the [ISES SWC50 The Century of Solar Stories and Vision Booklet](#) or the [ISES Solar Energy Museum – Past, Present and Future](#).

#### *Focus on China*

In 1978, representatives from twelve institutions including Beijing New-Technology Institute, Tsinghua University, Zhengzhou College of Technology, etc., met in Beijing. During the meeting they discussed how to develop solar energy applications in China and put forward the idea of setting up a relevant organization. After active preparation, the Chinese Solar Energy Society (CSES) came into existence in 1979. CSES registered at the International Solar Energy Society in 1980. CSES later changed to the China Renewable Energy Society (CRES).

CRES has more than 4000 members, made up of professionals in the renewable energy field and other stakeholders interested in renewable energy. Its membership features multidisciplinary and

multifunction expertise, engaged in such fields as solar PV, thermal energy, wind energy, biomass, solar power in buildings, geothermal power, hydrogen power, ocean energy, photochemistry, natural gas hydrate and others.

### **Sample of Pioneers Pre-1980**

Each month this Newsletter will have a sample of people involved with renewable energy prior to 1980.

It is impossible in this monthly newsletter to cover the thousands who have contributed to the development of renewable energy prior to 1980. What is included in each newsletter is just a snapshot of those involved. Those included in the newsletter are taken from the SWC50 celebratory booklet: *The Century of Solar-Stories and Visions*.

### **Defang Wang**

Defang Wang started his research into solar energy in 1955. He is known in China as is the founder of the design method for the thermal response coefficient. He has developed a variety of thermal process analysis software for passive solar house. In the 1980's in China, a considerable number of solar houses that had not been constructed in accordance with the correct method for building thermal calculations, or thermal calculations had not been performed at all. This resulted in low room temperature and failing to the room temperature failing to reach the predetermined predicted level. Defang Wang proposed relatively simple and practical calculation formulas and calculation parameters for natural convection heat transfer between the sunlight room and adjacent rooms through the opened doors. This included using direct benefit and collector wall (Trombe wall) thermal calculation mathematical models along with the simulation program PSHS, referred to as "Passive Solar House Thermal Calculation Software". In 1991, Defang Wang realized the connection of meteorological databases, engineering databases and graphic libraries in the same software and solved the problem of processing meteorological data used for the hourly thermal performance calculation of buildings This can directly meet the practical needs of engineering, and greatly promotes the transformation of scientific research results into productivity.

### **Yin Zhiqiang**

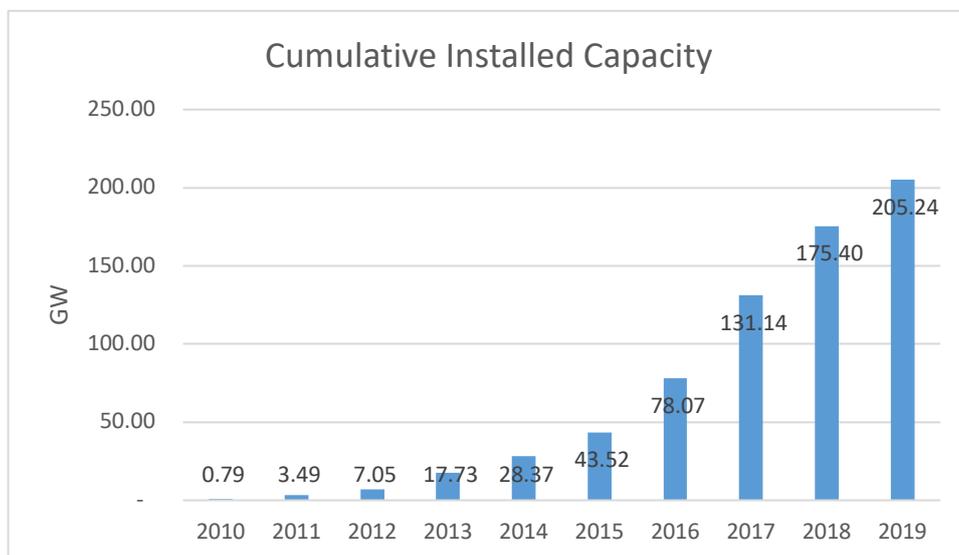
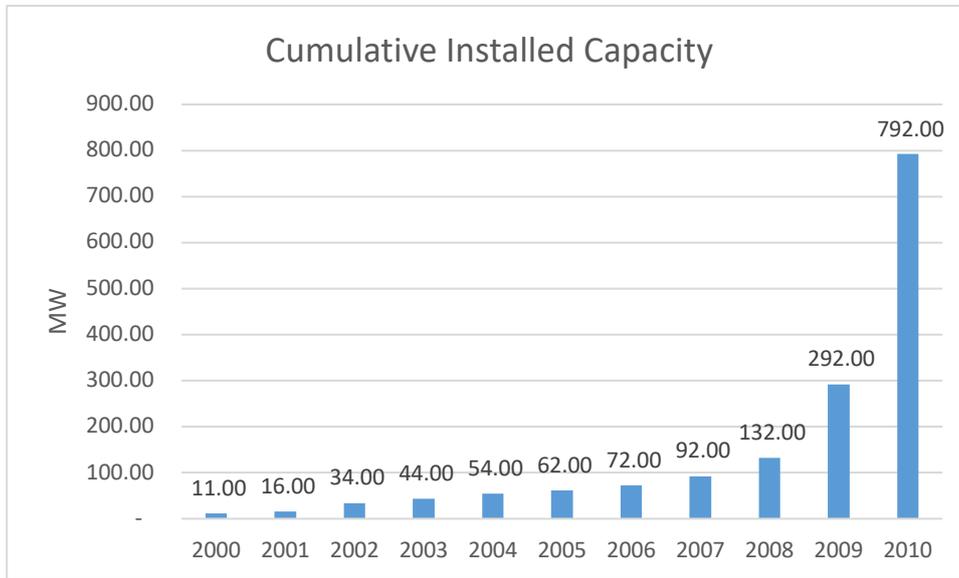
Yin Zhiqiang, is a Professor at Tsinghua University, Beijing and is the Chief Scientist for Tsinghua Solar Ltd., Beijing, China, and has been working on solar thermal since 1978. He invented "Al-N/Al selective absorbing surface" using a single-cathode magnetron sputtering, which has optimum solar absorptance and emittance with low cost. He also invented the "Water-in-glass" close-coupled solar water heater, and "E-W" direction of tubes of solar collectors and systems. He and co-workers developed the production line for manufacturing all-glass evacuated collector tube, all-glass evacuated tube collector and systems. He is the first author of three China national standards-"All glass evacuated solar collector tube", "Test methods for thermal performance of domestic solar water heating systems" and "Specification of domestic solar water heating systems" which are useful for supporting the developments of solar thermal industry. Today he is the project leader of ISO 22975-4 Solar Energy - Collector components and materials Part 4: Glazing material durability and performance.

For the current edition of the booklet there was two others from China listed in the pioneer's section.

| <b>Name</b>   | <b>Year Started</b> | <b>Research or Industry</b> |
|---------------|---------------------|-----------------------------|
| Ruzhu Wang    | 1993                | Research                    |
| Shi Zhengrong | 1995                | Research                    |

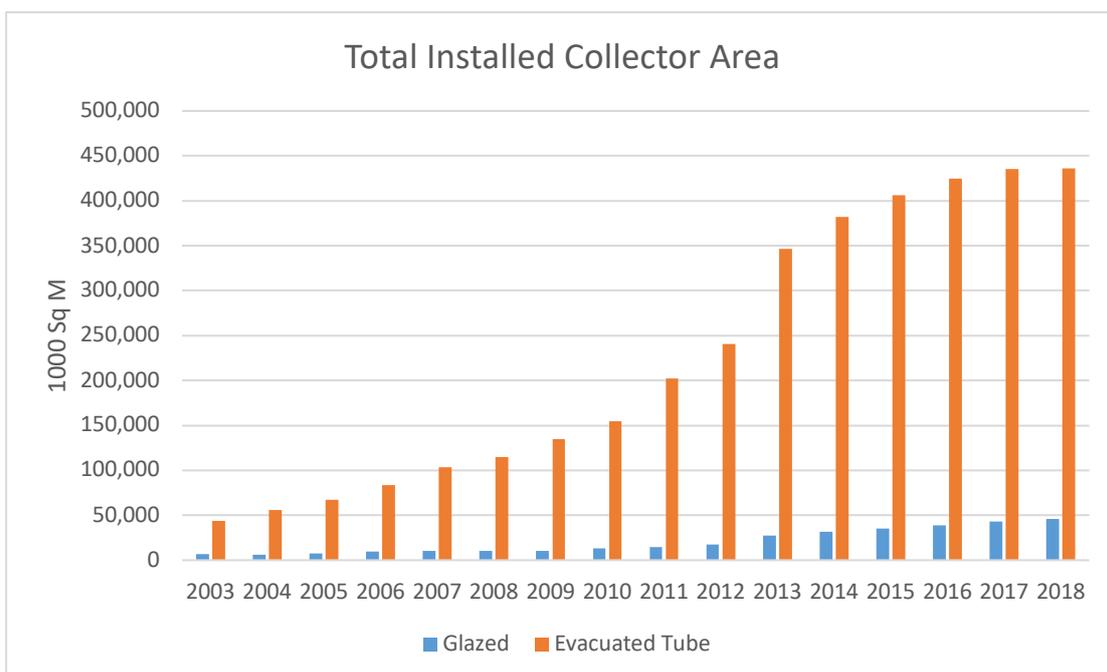
### **Growth in Solar Photovoltaics**

The growth is shown in two charts. The first is in MW between 2000 and 2010. The second is shown in GW between 2010 and 2019.



Source- IEA PVPS Trends Reports

## Solar Thermal (Water Collectors)



Source- IEA-SHC Annual Solar Heat Worldwide

### **Renewable Energy Pioneers**

Without the efforts of individual researchers, system designers, system installers, business leaders, policy makers and those within the donor community, the renewable energy industry would not have grown from watts to Gigawatts in the last 50 years. ISES' way of acknowledging the many people was by issuing a call for the submission of Renewable Energy Pioneers to be listed in the celebratory booklet.

ISES will be releasing an updated version of the booklet in December 2021 and therefore **ISES is re-issuing the call for submissions of the names of individuals covering the following two categories:**

1. **Research Pioneers:** Individuals who started their research in 1995 or earlier.
2. **Industry Pioneers:** Individuals who actively started working in or with the renewable energy industry in 1995 or earlier.

Names and information can be submitted [here](#) . Individuals can submit on behalf of themselves or on behalf of someone else, in particular for those who might have passed away.

### **Partners of SWC50**

ISES acknowledges the support provided by the Platinum Partners: GSES from Australia and NREL from USA; Gold Partner: Smart Energy from Turkey.

