



**JOIN THE CENTURY OF SOLAR**

A Year of Virtual Celebration

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

This month we provide

- A brief overview of solar research and applications in the decade 2000-2009 (2000's);
- A focus on Turkey; and
- A special announcement about **SWC 2021**

The overview of solar in the 2000'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 2000's***

Significant events in the history of ISES in the 2000's include:

- In 2000, The Millennium Solar Forum was organized by ISES in Mexico City.
- In 2000, ISES and UNEP organized a highly successful *Seminar on Rural Energy Provision in Africa* (SEREPRO), part of the second phase of the ISES Utilities for Africa initiative.
- In 2001, Rian van Staden became ISES Executive Director.
- In 2002, Dr. Karl Böer agreed to serve as editor of the proposed book, *The Early Years of ISES* which was to become the 50 Year History of ISES and its National Sections.
- The first woman elected as President of ISES, Prof. Anne Grete Hestnes takes office on 1<sup>st</sup> January 2002
- In 2002, Prof. Yogi Goswami becomes Editor-in-Chief of *Solar Energy* journal. A position he held until 2021.
- ISES made a strong showing at the *Renewables 2004* conference in Bonn in early June.
- ISES, together with the World Wind Energy Association (WWEA) and the International Hydropower Association (IHA), became a founding member of the International Renewable Energy Alliance (later renamed to REN-Alliance) during the Bonn International Renewable Energy Conference

### **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 commemorated in 2020 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.



*The Staff at ISES Headquarters in June 2001, at the time of Burkhard Holder's resignation due to ill health. Rian van Staden, fourth from the right, would become Executive Director and Christine Hornstein, 9th from the right, the Deputy Executive Director.*

*(Source: The 50 Years History of ISES)*

- August 2005: ISES, together with its U.S. Section the American Solar Energy Society, celebrates its Golden Jubilee at the Solar World Congress in Orlando/Florida, USA. The ISES publication "The Fifty-Year History of the International Solar Energy Society and its National Sections" is released during the Congress.
- In 2005, ISES launches the Pocket Reference Books with the release of the first book "Solar Energy Pocket Reference".
- In 2005, Rian van Staden steps down as Executive Director of ISES after 4 years in the role. He had worked at ISES HQ since it moved to Freiberg in 1995. Christine Hornstein was named the new Executive Director.
- In 2007, ISES inaugurates the Solar Carport at the Headquarters Office, Villa Tannheim in Freiburg.
- Monica Oliphant from Australia is elected ISES President for 2008-2009 becoming only the second female president of ISES.
- Christine Hornstein represented ISES at the Founding Conference of IRENA in Bonn on 29 January 2009.

#### ***ISES Presidents in the 2000's***

<b>Years</b>	<b>President</b>	<b>Country</b>
2000-2001	Cesare Silvi	Italy
2002-2003	Anne Grete Hestnes	Norway
2004-2005	D. Yogi Goswami	USA
2006-2007	Torben Esbensen	Denmark
2008-2009	Monica Oliphant	Australia

### Conferences 2000's

Year	Location	Overview
2001	Adelaide Australia	Theme: <i>Bringing Solar Down to Earth</i>
2003	Göteborg Sweden	Theme: <i>Solar Energy for the Built Environment</i>
2005	Orlando USA	Theme: <i>Solar Energy: Bringing Water to the World and The History of Solar Energy and ISES</i>
2007	Beijing China	Theme: Solar Energy and Human Settlement
2009	Johannesburg South Africa	Theme: Renewable Energy Shaping our Future

### Photovoltaics' 2000's

The new decade started with the feed-in tariff (FIT) through the "EEC" renewable energy law being introduced in Germany, one of the programs that increased the use of PV particularly in Germany. For 2004 to 2007 and in 2009 more than 50% of the PV installed each year globally was installed in Germany (highest being 66% in 2006). Spain was over 50% in 2008 because they introduced a FIT. Over the decade more countries introduced feed-in tariffs and various other incentive programs were introduced. China introduced the Renewable Energy Law in 2005 that saw the number of Chinese manufactures increase which was the start of the future Chinese domination of the market. The price of solar modules fell dramatically in the later part of the decade. By about 2003 more 3-5MW systems were installed and these kept on growing as the decade progressed. During this decade the PV manufacturing base moved from being focussed in Japan, USA and Europe to China and some other Asian countries. MW replaces kW when quoting PV installation capacity.

In accordance with the IEA Trend Reports during the 2000's:

- Annual installations grew from 195MW in 2000 to almost 7,000MW(7GW) in 2009.
- Cumulative installed capacity grew from approximately 700MW in 2000 to approximately 23GW in 2009.
- In 2000 off grid systems represented 16% of the annual installations and by 2009 this had decreased to 1%.
- In 2000 off grid systems represented 39% of the cumulative installed capacity and by 2009 this had decreased to 4%.
- In 2000 grid connected centralised systems represented 0.8% of the annual installations and by 2009 this had grown to 60%.
- In 2000 grid connected centralised systems represented 5% of the cumulative installed capacity and by 2009 this had grown to 33%.

Significant events in the history of PV in the 2000's include:

- In 2000, at the **International Space Station**, astronauts begin installing solar panels on what will be the largest solar power array deployed in space. Each "wing" of the array consists of 32,800 solar cells.
- In 2000, Herman Scheer and Hans Josef Fell through the **Renewable Energy Act (Erneuerbare Energien Gesetz, or EEG)** established the Feed in Tariff (FIT) that would be supportive for PV in Germany (The Feed In Traiff Law of 1991 promoted wind and the Tariff for PV was too little). The EEG led to the rapid expansion of the PV Industry.
- In 2001, NASA's solar-powered aircraft, **Helios**, sets a new world record for non-rocket powered aircraft: 96,863 feet, more than 18 miles high.
- On April 29<sup>th</sup> 2003, the world's largest photovoltaic plant at that time was connected to the public grid in Hemau near Regensburg (Bavaria), Germany. The peak power of the "Solarpark Hemau" plant was 4 MW.
- In 2004, Due to the "EEC" renewable energy law many other large systems of up to 5 MW were built in Germany in 2004. Some of these are Geiseltalsee, Leipzig, Bürstadt, Götterborn solar parks.
- In 2004, 1GW of solar modules are shipped for the first time.

- In 2005, China's Renewable Energy Law was introduced. The Law imposed a national renewable energy requirement with the objective to boost the use of renewable energy capacity up to 10 percent by the year 2020.

### **Solar Thermal 2000's**

From 2000's onwards with concerns about climate change growing many government introduce subsidy programs that lead to large increases in the market across the 2000's.

Key points from the IEA SHC data:

- The total recorded annual installed capacity increased from 9 million m<sup>2</sup> in 2000 to 49.5 million m<sup>2</sup> in 2009.
- China dominance of the market grew from being 71.5% of the total recorded annual installed capacity in 2000 to 84.9% in 2009.
- In 2000 Evacuated Tube Collectors (ETC) represented 58% of the recorded annual installed capacity and this grew to 82% in 2009.
- The dominance of ETC's is due to the China market where in 2000 80% of the annual installed capacity were ETC's growing to 95.2% in 2009. In the ROW ETC represented only 4% growing to 9% in 2009.

Other significant events in the history of Solar Thermal in the 2000's include:

- In 2000, Start of 'Solar Keymark' project by European Solar Industry Federation (ESIF) supported by the European Commission, under its ALTENER programme
- In 2001, European standards EN 12975 for solar collectors, EN 12976 for factory made systems and EN 12977 for custom built systems were introduced.
- At an international meeting in Gleisdorf Austria in September 2004 it was agreed upon the conversion factor of 0.7 kWth/m<sup>2</sup> in order to convert collector area to thermal power capacity. Since then, the factor was quickly adopted and recognised, and it is now used worldwide.
- In 2005, The "European Solar Thermal Technology Platform" (ESTTP) was established. This was initiated by Werner Weiss, Gerhard Stryi-Hipp, Harald Drück et. al.
- In 2008, The European Solar thermal market has its historical record sales year, reaching 3,3 GWth of new capacity, equivalent to 4,75 mil m<sup>2</sup> of collector area.

### **CSP 2000's**

Significant developments included were:

- In 2003, the Eurotrough ,a parabolic trough collector, which has started in 1998 was completed. It was developed by a consortium of European companies and research centres.
- In 2004, a 1 MWth CSP plant using Fresnel technology was installed to supplement the 2000 MW coal-fired Liddell Power Station in Australia . It was subsequently increased up to 9 MWth by 2008. This was the world's first solar thermal power collector system for coal-fired power augmentation
- In 2006, the 1 MW Saguaro CSP trough demonstration plant was constructed in Arizona.
- In 2007, PS 10, a 10 MW steam power tower, began operation in Spain.
- In 2007, Nevada Solar One, a 64 MW trough plant in Nevada, began operation.

### **Solar Architecture/Buildings 1990's**

Significant developments included:

- In 2000, The U.S. Department of Energy launches the Solar Decathlon. Today, the 10 contests that are the foundation of the Solar Decathlon inspire student teams to design and build highly efficient buildings powered by renewables, while also taking into consideration affordability, resilience, and occupant health.
- On 1st January 2003, The Australian Building Codes Board introduced energy efficiency measures for houses into the Building Code of Australia (BCA).
- In December 2006, the UK government announced that by 2016 all new homes in England will be zero energy buildings.
- In 2006 the Masdar City (United Arab Emirates) planned solar and renewable city southeast of Abu Dhabi is initiated with construction starting in 2008. IRENA's headquarters is located in Masdar City.

- In October 2007, the Malaysian Energy Centre (PTM) successfully completed the development and construction of the PTM Zero Energy Office (ZEO) Building.
- In 2009, the 71 story zero energy office buildings the Pearl River Tower, opens in Gunagzhou China.
- Singapore's first zero-energy building was launched in October 2009 at the inaugural Singapore Green Building Week.

### **PV in Developing Countries 2000's**

Donor driven projects increase, and more international organisations are formed with the focus on supporting the growth of solar home systems being deployed in developing countries. More companies start and close as the solar home market tries to get established in many countries globally. This decade sees a number of manufacturers established with the focus on plug and play small solar home systems (SHS) that allows the end-users to self-install. A number of these are the companies that transformed the SHS market into the vibrant commodity market that exists today. Near the end of the decade a new World Bank Group Initiative, Lighting Africa will lead the way in the use of quality plug and play systems that helps initiate the new commodity market for SHS. The grid connected PV market is growing substantially however several industry people are unaware of, or interested in, the need for solar energy solutions in the developing world. This led to a new industry association, Alliance for Rural Electrification being formed to focus on this market from the industry perspective.

In 2000 1.36 billion people in the world did not have access to electricity representing 22.3% of the total population. This had decreased to 1.17 billion by 2009 representing 16.8% of the population

Other significant developments included:

- The Renewable Energy and Efficiency Partnership (**REEEP**) was launched by the government of the United Kingdom, along with other partners, at the Johannesburg World Summit on Sustainable Development (WSSD) in **August 2002**. **REEEP** is based in Vienna and has the objective of advancing markets for renewable energy and energy efficiency particularly within the emerging markets and developing countries.
- **Lighting Africa** is launched in **September 2007**. The initiative is jointly managed by the World Bank and the International Finance Corporation (IFC), leveraging the comparative advantage of both organizations to support the rapid scale-up and delivery of modern off-grid lighting to Sub-Saharan Africa. **Lighting Africa** builds upon the pioneering work of the Lighting the Bottom of the Pyramid (LBOP) program, which was created by IFC. The objective is to develop a Quality Assurance Program for the plug and play solar home systems.
- In 20017, the then **European PV Industry Association (EPIA)** created the **Alliance for Rural Electrification (ARE)**. The Alliance for Rural Electrification (ARE) was created in response to the need for access to sustainable electricity in the developing world and to facilitate the involvement of ARE members in emerging rural energy markets.

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 Turkey**

Interest in solar energy research and development in Turkey was initiated after the NATO Advanced Study Institute on Solar and Aeolian Energy meeting, which was held at Sounion, Greece, during the summer of 1961. Mr. Kudret Selçuk, who was an instructor at the Middle East Technical University (METU) in Ankara, Turkey, attended the seminar.

Selçuk built the first solar collector, made out of corrugated galvanized sheet metal, at METU and gave lectures to emphasize the importance of solar energy. He received a NATO grant to undertake research under John Yellott, one of the early solar pioneers. In 1963 a course on Solar Energy Utilization was offered by Selçuk at the Mechanical Engineering Department of METU.

In 1964 the local Solar Energy Society COMPLES (Cooperation Mediterranean pour l'Énergie Solaire), headquartered at the University of Marseille, France, was founded, and Turkey became one of the founding members.

The scientific research initiated by Dr. Selçuk in the 1960s in Turkey was continued at METU.

After the 1974 oil crises, Turkish universities started to show a great interest in solar energy.

The Turkish branch of the International Solar Energy Society (ISES–Turkey) was formed in 1992 by people involved in solar energy in Turkey. The first chairman of ISES Turkey was Mr. Suheyl Elbir. The initial board of directors consisted of Dr. D. Inan, Dr. A. Ecevit, Dr. G. Atagunduz, Mr. I. Ezinc, Mr. K. Koman, Mr. R. Durdu, and Mr. Suheyl Elbir.

GÜNDER in Turkey has been the ISES representative in Turkey. It is an industry association which also undertakes research and conducts conferences like SOLARTR.

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

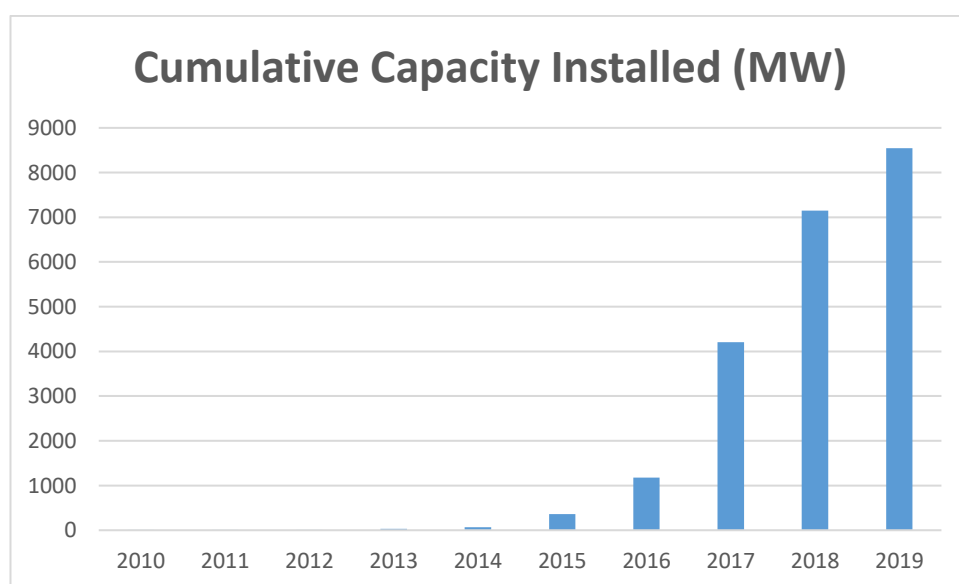
Each month this newsletter will have a sample of people involved with renewable energy prior to 1980. These come from the focus country for that edition of the newsletter.

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

### **Prof Dr A Nilufer Egrican**

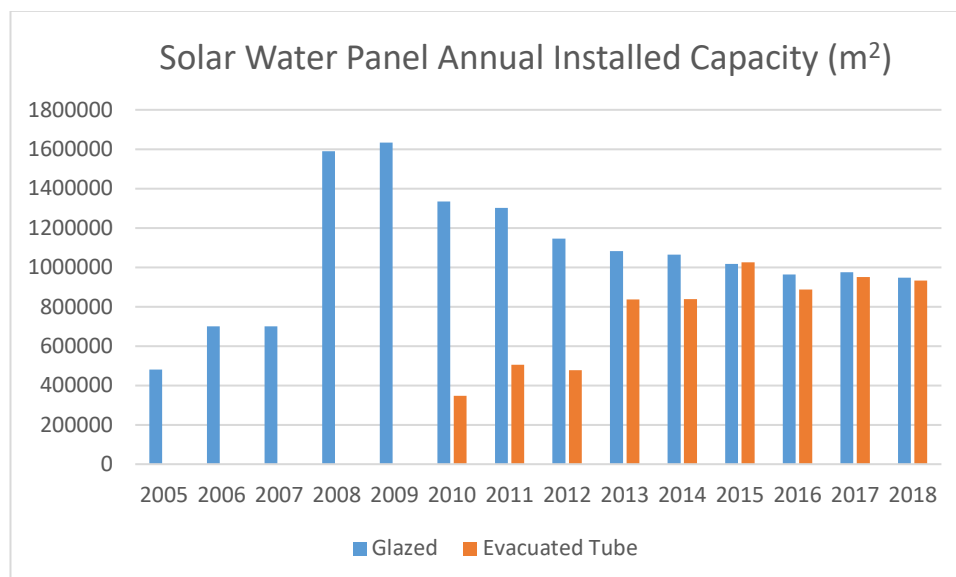
Prof. Dr. A. Nilufer Egrican began her work in solar energy in 1975 at the University of Maryland when she did research on solar powered absorption cooling and on solar powered Rankine engines for solar cooling. From that time on, Dr. Egrican continued to work in the area of applied thermodynamics as it relates to solar thermal systems, such as passive solar heating, solar water and space heating. In 1982, Dr. Egrican began a teaching career at the Technical University of Istanbul where she rose from Assistant Professor to Dean of Engineering. Dr. Egrican then became a Professor and Rector of the Yeditepe University until she retired in 2011. During her tenure at these universities, Dr. Egrican advised many students who went on to careers in solar energy, she published a large number of research papers and made many presentations related to the thermodynamics of solar heating and cooling. Dr. Egrican formed a consulting company, Suntek International, where she continues to work on solar energy projects. Dr. Egrican is also very active in international associations and journals. She is President of the International Center for Applied Thermodynamics and is Editor of the International Journal of Applied Thermodynamics.

### **Growth in Solar in Turkey Photovoltaics**



Source- IEA PVPS Trends Report 2020

## Solar Thermal (Water Collectors)



Source- IEA-SHC Annual Solar Heat Worldwide (2007-2020)

### 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. (**Note:** If you have previously submitted and are included in the current edition of the booklet, you will be included in the updated edition and do not need to resubmit.)

### 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.



**ISES Solar World Congress 2021**

From October 25-29, the [ISES Solar World Congress 2021](https://www.swc2021.org/) will take place as an online event and we are looking forward to this first ever virtual Solar World Congress!



### **Highlight your solar expertise by becoming a SWC 2021 Sponsor!**

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of opportunities for your company/institution to communicate to decision makers, project developers, businesses, researchers and financiers of the significant technological advances and commercial successes of solar energy technologies. This engaging and unique setting of the Solar World Congress offers you instrumental reach and networking opportunities on a global level.

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- Access to international solar energy experts, including promising young professionals
- Speaking opportunity

[Learn more here!](https://www.swc2021.org/)