



JOIN THE CENTURY OF SOLAR

A Year of Virtual Celebration

SWC50-The Century of Solar Virtual Conference Newsletter – August 2020

Focus on USA

In the early 1950's a few visionaries believed that it was time to elevate solar energy, the most important source of life on earth, to become the foundational source of all energy consumed by humankind.

One leader of this group of visionaries was Farrington Daniels, who first suggested the need for an organization to promote the development and application of solar energy and create a solar industry. In 1954 three other pioneers, Henry Sargent, Walter Bimson and Frank Snell created the Association for Applied Solar Energy (ASAFE) in Arizona. In 1963 AFASE changed its name to the Solar Energy Society. In 1970, the SES board agreed to change the name to the International Solar Energy Society (ISES) and the American Solar Energy Society (ASES) became the USA section.

American ISES Presidents

There have been 12 American Presidents of ISES and it's predecessors AFASE, SES.

AFASE Presidents

Henry Sargent 1955	J. Oostermeier 1956-1959	H. Walmsley 1960-1963
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SES Presidents



Farrington Daniels
1964-1967



Peter. E. Glaser
1968-1969

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 will be held on 3 - 4 December 2020, with two follow up webinars in 2021 and a final session at the ISES Solar World Congress 2021 in New Delhi in October 2021

ISES Presidents



Jack A. Duffie
1973-1973



G. O. G. Löf
1973-1975



William (Bill) H. Klein
1975-1976



William A Beckman
1985-1987



Michael Nicklas
1993-1995



D. Yogi Goswami
2004-2005



Dave Renne
2009-2019

AFASE and SES Conferences in USA			ISES Conferences in USA		
Year	Location	Overview	Year	Location	Overview
1955	Tucson, Arizona USA	Conference on the Use of Solar Energy Approx 500 registrants, 93 papers	1971	Greenbelt, Maryland USA	Goddard Space Flight Center 180 in attendance, 40 papers
1955	Phoenix, Arizona USA	World Symposium on Applied Solar Energy 900 registrants Sun at Work Exhibition; 29,000 visitors	1975	Los Angeles California USA	Theme: Solar Use Now; a Resource for People Nearly 2,000 registrants, 280 papers.
1957	Phoenix, Arizona USA	Solar Furnace Symposium Approx 200 registrants, 15 papers.	1979	Atlanta Georgia USA	Theme: Silver Jubilee Congress 2,000 registrants, 430 papers
1959	New York, NY USA	First Meeting of AFASE Advisory Council Sponsors: Approx 130 in attendance	1991	Denver USA	1991 Solar world Congress 1500 participants 100 displays
1965	Phoenix, Arizona USA	Annual Meeting of SES Approx 50 papers, 110 in attendance	2005	Orlando, USA	Theme: Solar Energy: Bringing Water to the World and The History of Solar Energy and ISES
1966	Boston Massachusetts USA	Second Annual meeting SES conference Approx 43 papers			
1967	Tempe Arizona USA	Industrial Aspects of Solar Energy Approx 100 in Attendance.			
1968	Palo Alto California USA	4 th Annual Meeting of SES			

Sample of American Pioneers Pre-1980

Each month this newsletter will have a sample of the people involved with renewable energy prior to 1980, coming from both research and industry.

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 will just be a snapshot of those who will be included SWC50 celebratory booklet: *The Century of Solar - Stories and Visions*.

This month we continue the American focus. However selecting who to include for this was very difficult because there are many people who can be acknowledged. Many things related to solar did first happen in USA such as the development of silicon solar cell in 1954, large solar thermal systems and many of the early PV manufacturers. To spread it across the spectrum we include mention of the three people accredited with creating the silicon solar cell, two people who have contributed immensely to ISES and ASES over many years and two individuals who started their solar retail/wholesale businesses in the late 1970's.

Gerald Pearson, Darryl Chapin and Calvin Fuller

In April 1954 three scientists, Daryl Chapin, Calvin Fuller, and Gerald Pearson are collectively accredited with developing the silicon photovoltaic (PV) cell at **Bell Laboratories**. In the early 1950's Fuller and Pearson were pioneering work on the silicon transistor when they discovered outside energy could dislodge electrons on a p-n junction. Meanwhile Chapin, a chemist at the laboratories had been given the task to develop alternative forms of energy because the traditional dry cell battery used by Bell in remote regions degraded rapidly in hot humid tropical locations and he started research on the selenium solar cell. Chapin's work became known to Pearson and the three then worked together and as they say the rest is history...

Frederick Morse

Fred Morse has served on the Boards of the American Solar Energy Society and the International Solar Energy Society collectively for decades. He was Vice-President of ISES back in 1974 and was still on the ISES board up to end of 2019. He is one of the members of the SWC50 International Organising Committee.

Fred became involved in renewable energy issues in the late 1960s when he served as Executive Director of the White House Assessment of Solar Energy as a National Energy Resource. Fred then went to the National Science Foundation to help put together the solar energy R&D program that was recommended in that report. In 1976 he joined the US Department of Energy where he played a significant role in defining and managing the Solar Heating and Cooling, Photovoltaics and Concentrating Solar - thermal Power (CSP) programs. In the late 1970s he helped form the U.S. Passive Solar Industry Council and the U. S. Solar Energy Industries Association where he was a Board member for many years, and he chaired the Utility-Scale Solar Power Division. Fred was active in the International Energy Agency where he helped to form, and chair, the Solar Heating and Cooling Program and he helped form the Photovoltaic Power Systems and Demand-Side Management Programs.

Fred left the Department of Energy in 1989 and formed a renewable energy consulting company. In 2007 he became the Senior Advisor for US Operations for Abengoa Solar, Inc. where he led the company's business development activities in the US. Fred played a key role in the development and financing of the Solana and Mojave CSP plants, each 280 MW with a combined investment of about \$4 Billion.

Professor Karl Böer

In 1972 Prof. Karl Böer was the founding director of the University of Delaware's Institute of Energy Conversions (IEC) where he led the research on thin film cells. In 1973 he initiated the construction of the solar display house known as Solar One. In 1973 with investment from Shell he founded Solar Energy Systems to develop and manufacture cadmium sulfide solar cells but in 1975 he returned to the University of Delaware to continue his research.

Karl conducted research and published peer reviewed papers until age 91. His scientific contributions include more than 350 publications, 28 patents, and several books.

He also served as President of the American Solar Energy Society, and as Editor-in-Chief of *Advances in Solar Energy*, which is a professional review journal that annually summarizes worldwide achievements in the field of solar energy.

The prestigious Karl W. Böer Solar Energy Medal of Merit was created in his honor by the University of Delaware, in 1987. It is awarded to individuals who have made extraordinary, valuable, and enduring contributions in solar energy or other forms of renewable energy through research, development, or economic enterprise. Since 1993, the Medal has been awarded to an inspiring list of visionary researchers, entrepreneurs, and world leaders.

Karl was the driving force and editor of the "*The Fifty Year History of the International Solar Energy Society and its National Sections*" that was released in 2005.

Karl's wife Renate has also played a very active role in ASES and ISES serving as vice president of ISES in 2003 to 2005.

John Schaeffer

John Schaeffer was born in 1949 and graduated from UC Berkeley in 1971 from where he moved to an archetypal 'commune' in Mendocino County, two hours north of San Francisco and pioneered off-the-grid living on 300 acres in the outback with no creature comforts. After living on the commune called 'Rainbow' for several years he began to experiment with some battery powered systems, employing his Volkswagen bug in his 60 minute commute to a computer center in Ukiah to charge a spare battery while he drove.

In 1976, John experimented with hand-made wind generators from 55 gallon drums cut in half and added some 12 volt lighting and a 12 volt television to his rustic off-the-grid cabin.

Noticing the giant influx of 'back-to-the-landers' escaping city life in the late 1970s, John created a new retail store to cater to these people called '**Real Goods Trading Company**' which became very successful and soon there were three Real Goods stores in Northern California and the clientele consisted of off-the-grid pioneers. In 1978 Schaeffer located what appeared to be the very first photovoltaic module and he offered them for sale – these were 9-watt space program rejects that sold for \$100 per watt, and they sold like hot cakes. At the time Real Goods was the first retail store in the USA selling these PV panels.

John went on to establish the Real Goods Solar Living Center in Hopland California that was a demonstration laboratory for all things sustainable including renewable energy, regenerative agriculture, alternatively powered vehicles, and much more. The Solar Living Center hosted over 5 million visitors from its inception in 1996 until Schaeffer sold it in 2019. Over those several decades, the non-profit Solar Living Institute, an offshoot of Real Goods, trained thousands into the solar industry, in natural building, and in regenerative agriculture.

David Katz

David Katz, was the founder and former CEO of Alternative Energy Engineering (AEE) Solar Inc., which now is part of SunRun, and is the current President of Tamarack Solar Products and Backwoods Solar Electric Systems. David is also the Co-founder and Technical Advisor of Simusolar Ltd., a company that provides solar water pumps to farmers in rural Tanzania and Uganda, east Africa.

David started his career in solar energy when, in 1979, he founded Alternative Energy Engineering, one of the first companies in the US selling off-grid solar electric power systems. David printed his first catalogue in 1981, and today the AEE Solar catalogue is widely regarded as the one of the industry's most useful solar PV resources.

David sold Alternative Energy Engineering to Idaho Power in 1999 and it became part of Applied Power Corporation (APC), where he was the Director of Sales. APC was acquired by Schott Glass of Mainz, Germany in 2000 and was renamed Schott Applied Power Corp. He served as Schott's Director of Purchasing where he convinced Sharp to sell their solar modules in the US, causing a large drop in module pricing.

In 2002 David purchased the company from Schott and renamed it AEE Solar. In 2005 AEE Solar was acquired by Mainstream Energy Corporation, of which Katz was the CEO and a shareholder.

David's influence extends deep into the solar industry, beyond the impact of AEE Solar itself, which, as part of SunRun, remains one of the largest and most successful wholesale solar equipment distributors.

David is a key figure in the USA off-grid community having helped thousands of remote homeowners electrify their homes. His pioneering work in solar water pumping and micro-hydro power systems are

unparalleled.

In his spare time David is an inventor and has developed products including a solar powered ATM with wireless communications used at outdoor solar and concert events.

David graduated from the University of Maryland in 1973 with a degree in Electrical Engineering. He worked for the U.S Department of Defense from 1974 through 1977 as an engineer in electronics before starting Alternative Energy Engineering.

ISES Solar Energy Museum - Past Present and Future Call for Contributions

ISES will be launching a virtual solar energy museum to mark the SWC50 – Virtual Conference in December 2020.

For the museum, ISES is looking for images of early products, systems and significant events that might be shown in the museum. In particular, ISES is looking for images from the pre-1990's.

If you believe you have relevant photos, videos or materials in formats that are suitable for posting in the online museum, please send these to either of the two e-mail addresses below.

Please include appropriate descriptions in the name of the files and possibly include a background story in a word document. All contributors will be acknowledged on the museum website.

If the materials are too large to send by e-mail please contact the organisers.

Jennifer McIntosh
Executive Secretary
International Solar Energy Society
swc50@ises.org

Geoff Stapleton
SWC50 Chair
swc50@gses.com.au

We look forward to receiving your contributions!

ISES is calling for submissions of the names of solar pioneering 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 online (<https://www.swc50.org/renewable-pioneers>) in the appropriate form. Individuals can submit on behalf of themselves or in behalf of someone else, particular those who might have passed away.

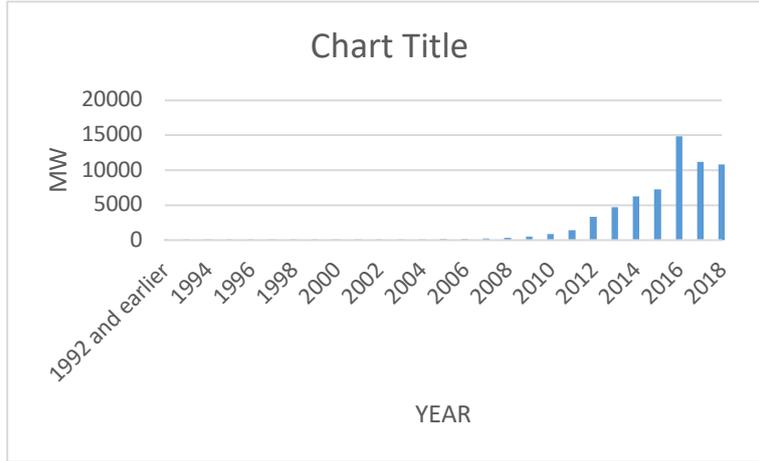
NOTE: Submissions Close 16th October 2020

Partners and Supporters

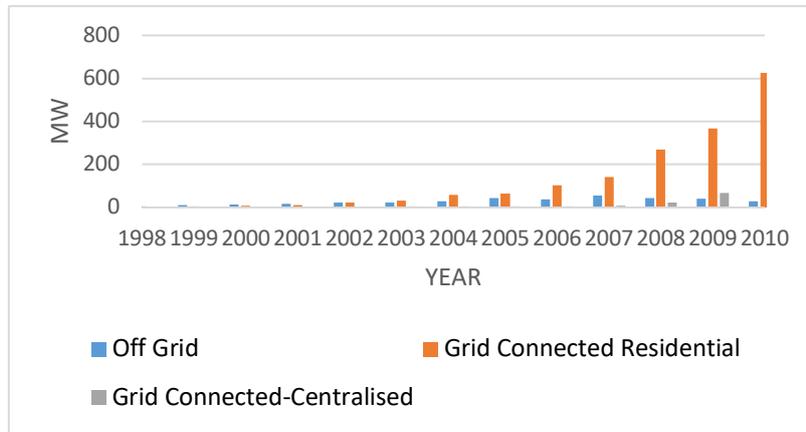
There is currently one partner and 18 supporters of SWC50. These can be found on the website <https://www.swc50.org/>

USA Growth in Solar

**Photovoltaics (PV) (Source IEA PVPS Trends Reports)
Solar Hot Water and Hot Air Collectors- Werner Weiss**

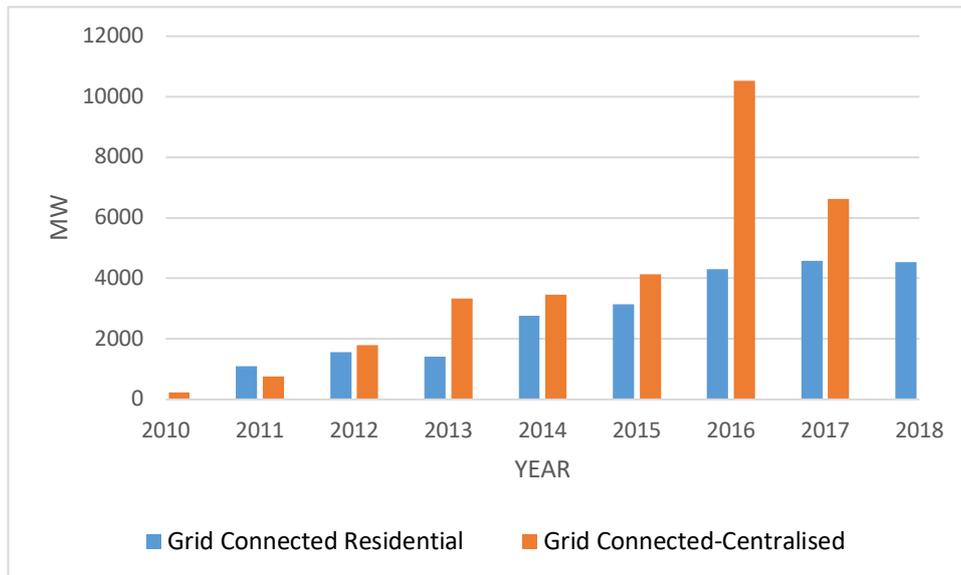


Total PV Installed Per Year 1992-2018

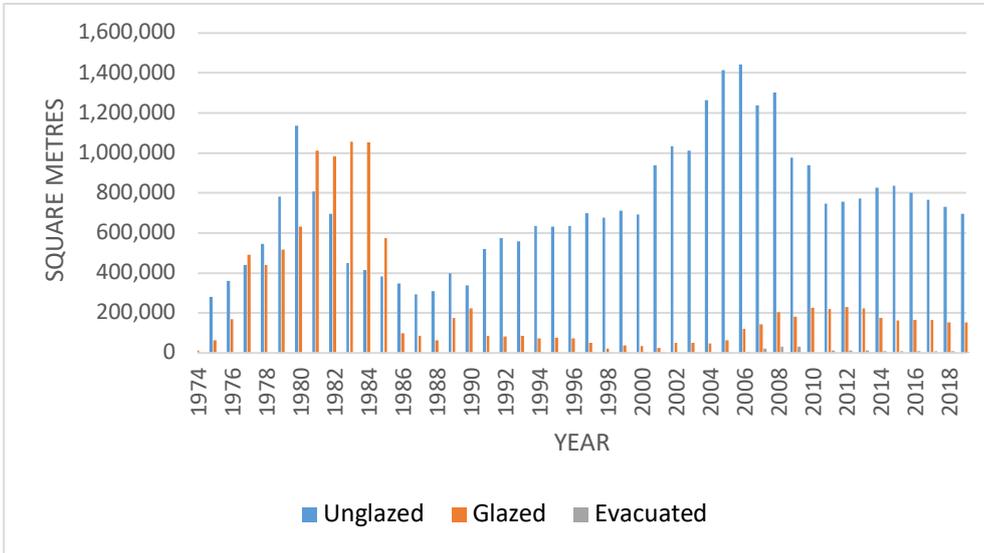


Comparison of Off Grid to Grid Connect Installations Per Year 1998-2010

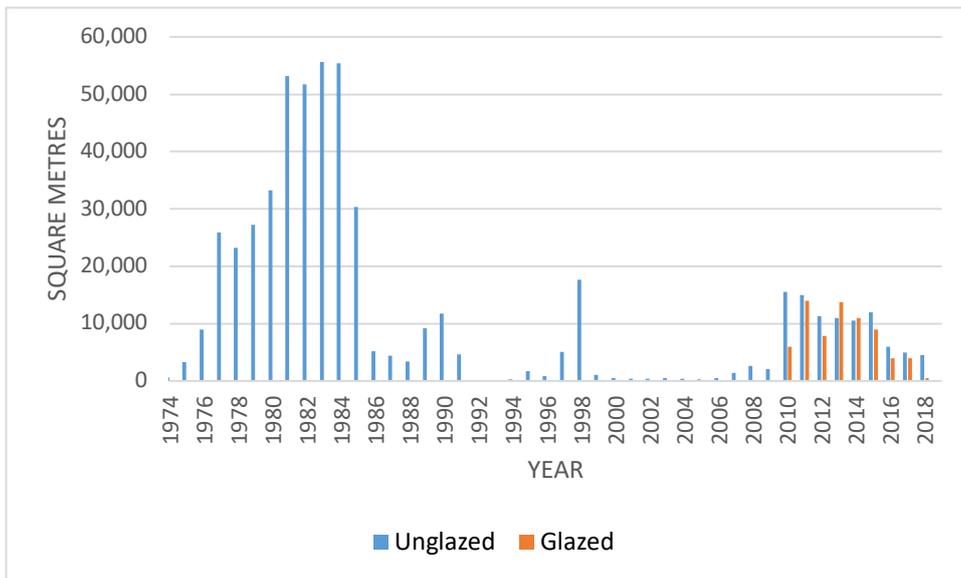
Note: IEA did not have off grid installation figures after 2010



Comparison of Grid Connect Installations Per Year 2010-2018



Comparison of Solar Hot Water Collectors Installed Per Year



Comparison of Hot Air Collectors Installed Per Year