

**Hong Kong Baptist University**

**GEOG 4065 Energy Policy and Analysis**

**Title of the Service-learning Project**

Desktop research on international case examples of women-led community-based sustainable energy development. (Cases of United States and Thailand)



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## **Introduction**

According to IRENA (2019), women hold 23% of the solar jobs globally (Figure 1). The following cases will show how the women renewable leaders act as the artery in promoting solar power in their community and different sectors.

### **Cascabel, Arizona, United State**

Located in the southwestern part of the United State, Arizona's climate and favorable geographical location has made the area the second largest solar energy producer in the state. <sup>1</sup>Ranking the 5<sup>th</sup> place in the country's installed solar PV capacity<sup>2</sup>. Solar energy in Arizona counts for around 6% of the total energy production, with a gradual increase in the generation of solar energy for local use. (31% out of total renewable energy generation comes from small scale solar photovoltaic sources, such as residential based rooftop panels<sup>3</sup>). The following parts focus on the woman-led role of solar power in the small town of Cascabel in Arizona.

For instance, located in the rural area of Arizona, the town Cascabel has been recognized as a ghost town with only 75 residents. With most of them are widowed/ divorced/ retired single women who make a living by practicing small-scale subsistence farming. It is a subsistence community feature with absence of mobile phone services and local grocery stores, as well as poor road and infrastructure. This gives a basis to the development of household based solar energy projects led by local women pioneers.

First of all, Betsy, one of the local leaders of the Cascabel Conservation Association, has cooperated with The Nature Conservancy, a famous non-profit environment institution as a pioneer of adopting household based renewable energy generation systems to showcase the use of solar energy innovation among the community. With technological assistance, solar panels have been installed. Electricity generated from solar panels has been used for maintaining the operation of her greenhouse farm and solar water pump has been used for aquaculture activities (Buechler, 2020).<sup>4</sup>

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<sup>1</sup> Sunrun. (2021, January 28). Arizona solar Incentives: Arizona solar rebates & tax credits. Retrieved February 14, 2021, from <https://www.sunrun.com/solar-by-state/az/arizona-solar-tax-incentives>

<sup>2</sup> Residential solar panels cost and savings in Arizona in 2021. (2021, January 29). Retrieved February 14, 2021, from <https://www.solarreviews.com/blog/average-residential-solar-panels-cost-and-savings-arizona>

<sup>3</sup> U.S. energy Information administration - eia - independent statistics and analysis. (n.d.). Retrieved February 14, 2021, from <https://www.eia.gov/state/analysis.php?sid=AZ>

<sup>4</sup> Buechler, Stephanie, Vázquez-García, Verónica, Martínez-Molina, Karina Guadalupe, & Sosa-Capistrán, Dulce María. (2020). Patriarchy and (electric) power? A feminist political ecology of solar energy use in Mexico and the United States. *Energy Research & Social Science*, 70, 101743. <https://doi.org/10.1016/j.erss.2020.101743>

Through collaboration with groups of relatively well-off female ranchers and retired professionals, the association gained credit for ordinating a solar energy-based community garden for local food production so as to enable sufficient food for local old and poor women. For instance, facilities such as solar-based electric fences are installed to restrict the entrance of wild animals. With an ultimate goal of transferring the community towards a sufficient green agricultural economy (Buechler, 2020).<sup>5</sup>

Besides, the woman-led community project in Cascabel is also secured and backed by the local government solar energy development policies. Local government performs actively in the solar development in the community with the provision of solar energy generation utility and the provision of tax incentive. And have been further promoted by the local woman-led community.

In this case, female leaders act as role models to spread knowledge about how local-based renewable energy projects bring benefit to the woman community and provide more energy choices for the rural population. They contribute through decreasing women's daily energy cost and changes the situation of gender stereotypes in technology production.

### **Wandee Kunchorngyakong, Thailand**

In the past few decades, natural gas has been playing a dominant role in Thailand's electricity generation. To secure the stability of energy resources, the Cabinet initiated Fit-In Tariff policy to motivate private sector investments in renewables in 2007 (Pita, Tia, Suksuntornsiri, Limpitipanich & Limmeechockchai, 2015).

Wandee Kunchorngyakong, a retired-aged PhD student-to-be, swiftly switched her goal from becoming a professor to promoting sustainable energy deployment the next year, in particular solar Photovoltaics.

She started to search for the country's potential in moving to solar-dependent, and realized Thailand has the strongest solar radiation level and sunshine availability within Southeast Asia. In other words, solar farm development within Thailand would be 3 times more energy-effective than that of in other developed countries (IEA, 2019).

However, as a retiree, she has been discredited by 9 banks, humiliated as a fool, and questioned by them because of her 50s' age when she was seeking for financing her first solar plant (Jackson, 2020). Despite challenges of her ageism and being a green hand, the more being rejected, the more enthusiastic she would make her dream come true.

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<sup>5</sup> Buechler, Stephanie, Vázquez-García, Verónica, Martínez-Molina, Karina Guadalupe, & Sosa-Capistrán, Dulce María. (2020). Patriarchy and (electric) power? A feminist political ecology of solar energy use in Mexico and the United States. *Energy Research & Social Science*, 70, 101743. <https://doi.org/10.1016/j.erss.2020.101743>

Eventually, her effort paid off by receiving an offer of 60% funding of her \$20 million business plan by the tenth bank – Kasikornbank, whereas the remaining capital was supported by her friends, family and the sale of her husband’s land and flat, making her wish into reality – not only one plant, but 36 after the government’s permit (Business Vision, 2020).

The woman solar plant pioneer founded her solar power conglomerate SPCG PCL, which consists of 36 solar plant networks with over 40 subsidiaries, solar farm and rooftop businesses, has listed on the Thailand Stock Exchange.

To adhere the social responsibility and to help the country’s energy transmission, Wandee ratified the 10-year contract to sell electricity to the Provincial Electricity Authority, expected to generate 250 megawatts, one-third of the country’s solar power capacity by the end of 2013 and to reduce around 200,000 tonnes of carbon annually, as well as planning to connect 10,000 rural households to the grid by rooftop solar panels (Corporate, 2012, Chudasri, 2013, IRENA, 2020) (Figure 2).

Moreover, not only she teaches the local women to learn to conquer their professional barriers by providing hands-on experience, but also contributes to her home by engaging more women into the sector. 60% of her employees, around 600 people are female and approximately 10% of them are in the director board, managing her latest solar farm investment targets in Japan and Myanmar (Corporate, 2012, IEA, 2019).

Her significant commitment brings Thailand a step forward to a renewable-dependent country with increasing female contribution recognition, which has been recognized by the UN, choosing her as the awardee of the ‘Momentum for Change – Women for Results’ award as a woman entrepreneur (Woods, 2014).

### **Lynn Jurich, the United State**

Lynn Jurich is a co-founder and the CEO of Sunrun, one of the largest market leaders in the US. Co-founded in 2007, its customer centered strategy establishes clean and affordable electricity service to customers in the residential sector. Headquartered in San Francisco, Sunrun’s services extend to 22 states, and the energy business continues to grow, creating more than 4500 jobs. Sunrun has offset around 2.7 Mt CO<sub>2</sub> by installing more than 1500 MW. It also helps customers save more than USD 200 million on electricity bills (IEA, 2019).

What motivated Lynn to initiate the company was the experience during the summer internship in China. Under the dusty and smoggy sky, she witnessed the first hand impact of pollution. This experience made Lynn realize that a clean environment should be a human right, and she recognized that solar energy is a good means to promote clean energy at household level.

However, at that time, the cost of buying and constructing solar panels was costly, and the payback period was long. These hindered people accepting solar plans. Lack of professional skills in maintenance also lower the incentive on using solar energy. Due to the above situation, Sunrun invented a unique business model “solar as a service”. This model firstly appeared in the market. It increases the accessibility of residential rooftop solar by offering several types of solar plans and services for residential customers to make suitable and affordable choices.

Sunrun not only provides the rooftop solar panel, but also offers home battery storage services to customers. The services include professional maintenance and monitoring of the solar panel (IEA, 2019). The selling point is, saving the environment and the electricity bills at the same time without extra cost. This “solar package” is acceptable and attractive for households to develop solar plans.

The first customer of Sunrun is a woman convinced by Lynn. After signing up with Sunrun, the woman was charged a fixed monthly rate for electricity for 20 years without having to buy the panels. And she was also guaranteed savings of up to 20% on electricity bills (Savchuk, 2016). This is the first step unlocking affordable energy in the residential rooftop sector (IEA, 2019).

Lynn is one of the most influential women in the world creating jobs and changing the world. Being a woman-led company, Sunrun is committed to take real action to address workplace inequality issues. The company provides equal leave and pay to its employees. It achieved 100% pay parity for its employees, regardless of gender, who perform similar work. Moreover, women comprise 50% of the senior leadership team, 38% of board of directors and 25% of workforce (IEA, 2019). Sunrun also collaborated with GRID Alternatives, serving low-income households and communities that also has a woman CEO and co-founder. Due to its outstanding business operation, Sunrun won awards for the Best Company Culture 2018, and the Best Company for Women 2018 (IEA, 2019).

### **Laura Stachel, the United States**

WE CARE (solar company) headquarter was set up in California while they provide service to the people in Africa and the low development level areas. They target the pregnant and the newborn to ensure their safety through the supply of electricity by the We Care Solar Suitcase.

Laura E. Stachel is the Co-founder and CEO of We Care. As a doctor, she studied the case of high maternal mortality in hospitals in Northern Nigeria, found that the inadequate and unstable electricity supply threaten regional public health, as medical staff are difficult to work in darkness. Her husband Hal Aronson, a solar energy educator, designed a “small off-grid solar electric system” (the base model of solar suitcase) for medical use on mothers and newborns there.

According to We Care Solar (2020), as the less developed region without stable and adequate supply of electricity, they aim to provide electricity by solar energy for medical use of mother and newborn to improve the environment of health facilities, reduce the death rate due to the complication of pregnancy, such as eclampsia and haemorrhage.

Figure 3 shows the design of the solar suitcase, it is user-friendly with lighting and communication function, to be used in emergency and medical purposes. The case is highly resistant to water and dust to withstand the harsh environment in poor regions, with solar panels and LED lamps and charger overhead. It is safe, easy to maintain with high durability, which was first in deployment in June 2009, Uganda (E-Town, 2021). The suitcase has benefited more than 20 countries for health care, including Haiti and the Philippines, in response to the Typhoon Haiyan, 2013, with the assistance of the World Health Organization (E-Town, 2021). Since then, each of the national beneficiaries has developed a primary health centre to allow training for local technicians and trainees.

Due to her female identity and her job nature, she cares much for the medical safety of the mother and newborns, she also seeks help from her husband to invent a solar suitcase, using sustainable energy to support medical service in poor regions. Her solar power trial helps the needy integrate advanced medication with provision of hand-on training for the locals. For this reason, the company has built up numerous partnerships with non-governmental organizations, like AMREF, where her effort was recognized by the UN, delivering her the “Powering the Future We Want” Award in 2015 (C3E, 2021).

### **Conclusion**

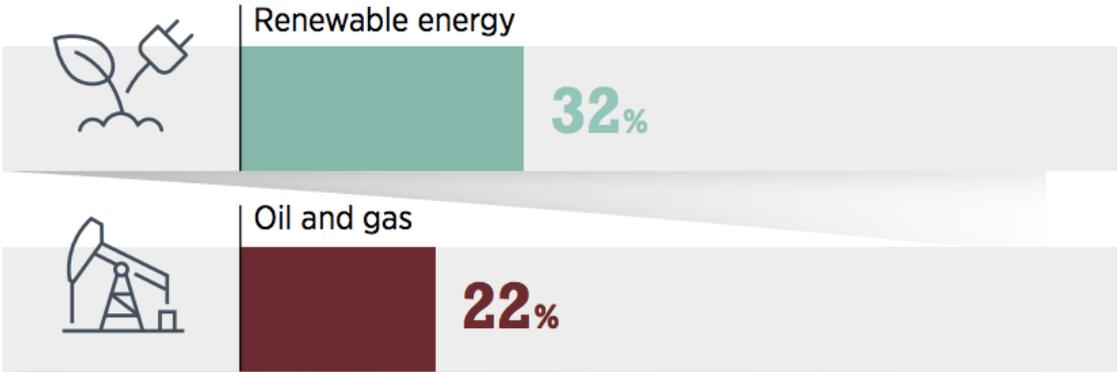
To conclude, women play an important role in promoting renewable energy in many different sectors, such as being an entrepreneur and doctor. With their strong input and commitment to their society, women have proved that they can be as successful as men in both local and international sustainable affairs, leaving profound influence on their society. (1,910 words)

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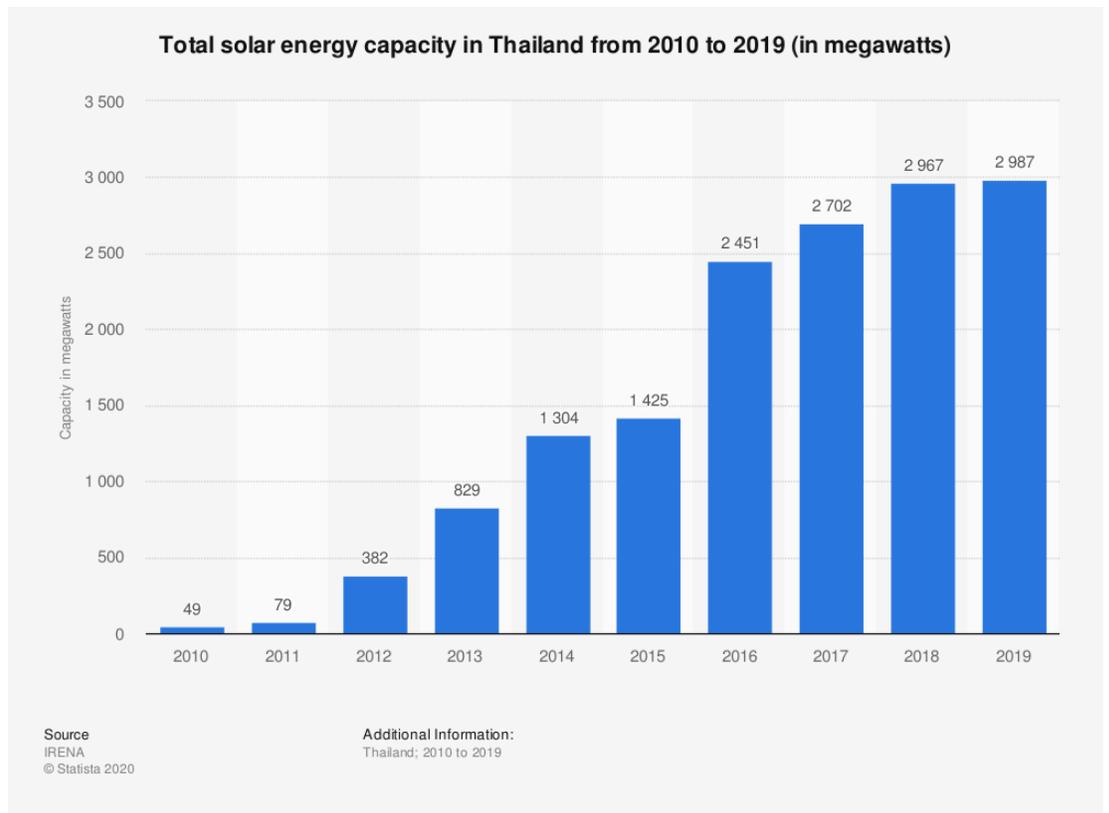
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**Appendix**

Figure No.	Descriptions						
1	<p><b>Figure 2.2</b> Share of female full-time workforce in renewable energy and oil and gas</p>  <p>The chart consists of two horizontal bars. The top bar is labeled 'Renewable energy' and features an icon of a leaf and a plug. The bar is 32% green. The bottom bar is labeled 'Oil and gas' and features an icon of an oil pumpjack. The bar is 22% dark red.</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Share of female full-time workforce</th> </tr> </thead> <tbody> <tr> <td>Renewable energy</td> <td>32%</td> </tr> <tr> <td>Oil and gas</td> <td>22%</td> </tr> </tbody> </table> <p>Sources: IRENA online gender survey, 2018; Rick <i>et al.</i> (2017).</p> <p>The survey primarily covers Europe and North America, as well as Southeast Asia, conducted by the International Renewable Energy Agency, 2019.          © International Renewable Energy Agency. (2019). Renewable Energy: A gender perspective. <i>International Renewable Energy Agency</i>. pp. 30.</p> 	Category	Share of female full-time workforce	Renewable energy	32%	Oil and gas	22%
Category	Share of female full-time workforce						
Renewable energy	32%						
Oil and gas	22%						

2



Total solar energy capacity in Thailand in 2013 is 829 megawatts.

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Solar Suitcase

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