REAL ESTATE INFRASTRUCTURE | ENERGY BUILDING | GREEN TECHNOLOGY

Produce your own electricity day and night

24 Hours Electricity from the Sun

First and foremost, build an energy building which has two functions: to store energy and distribute power. Generate 24 hours electricity from the Sun, produce your own electricity. It should have the largest array of solar panels and is divided in three rooms: the control room, hydrogen room and battery room.

Excess power from the photovoltaic (semiconductor which converts light into electricity) is used to power electrolysers that split water into its composite gases (hydrogen and carbon). The hydrogen gas is then stored in tanks. The energy storage is a hybrid battery-hydrogen system. The bulk of the nightly demand is covered by the fuel cells using hydrogen, while the batteries help cover short peaks in demand.

During the day, solar power is used to run a hydrogen electrolyzer to produce hydrogen and store it in tanks. The hydrogen is then used in a fuel cell to generate electricity once the sun goes down. The only by-products of this premier green technology are oxygen and water. The oxygen emitted from this system will help in become carbon negative much sooner. This scalable technology combines batteries with a self-recharging hydrogen energy storage system to maximise the advantages.

FULL SYSTEM UTILIZATION

Energy Calculations

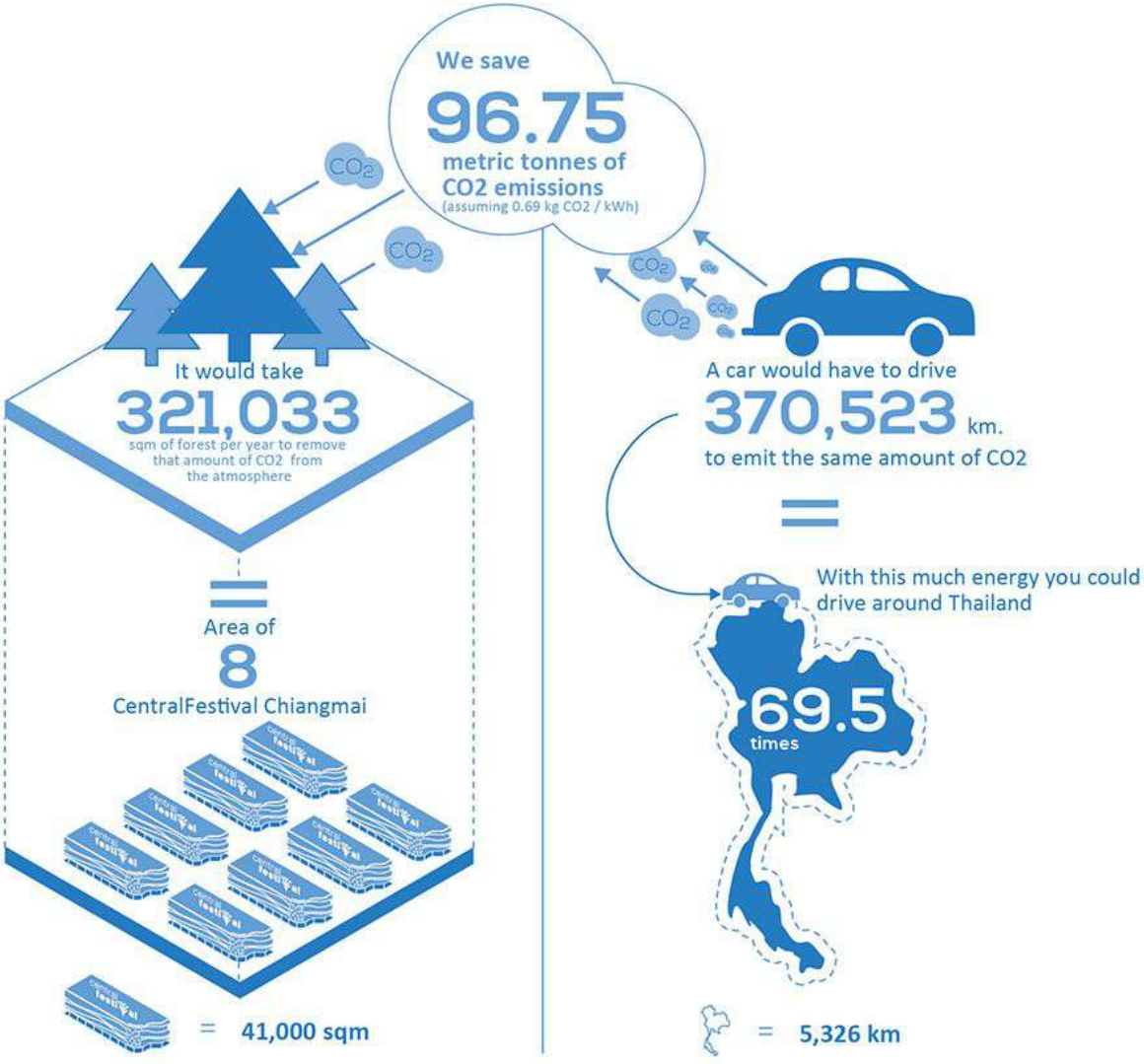
ENERGY BUILDING	GUEST HOUSE A	GUEST HOUSE B	Main House	6 kW solar pump for pond waterfall	9 kW solar pump for swimming pool and well pump
					
330 w	**315 w**	**315 w**	**250 w**	**250 w**	**250 w**
75 solar panels	64 solar panels	64 solar panels	84 solar panels are made in Chiang Mai!	24 solar panels	36 solar panels

Average overall yield is equivalent to 3.8 hrs of full irradiation per day

(75 x 330W) + (64x 315 W) + (64 x 315 W) + (84 x 250W) + (24 x 250W) + (36 x 250W) = 101.1 kW

101.1kW x 3.8hr = 384.2 kWh / day
384.2 kWh x 365 days = 140,233 kWh/year

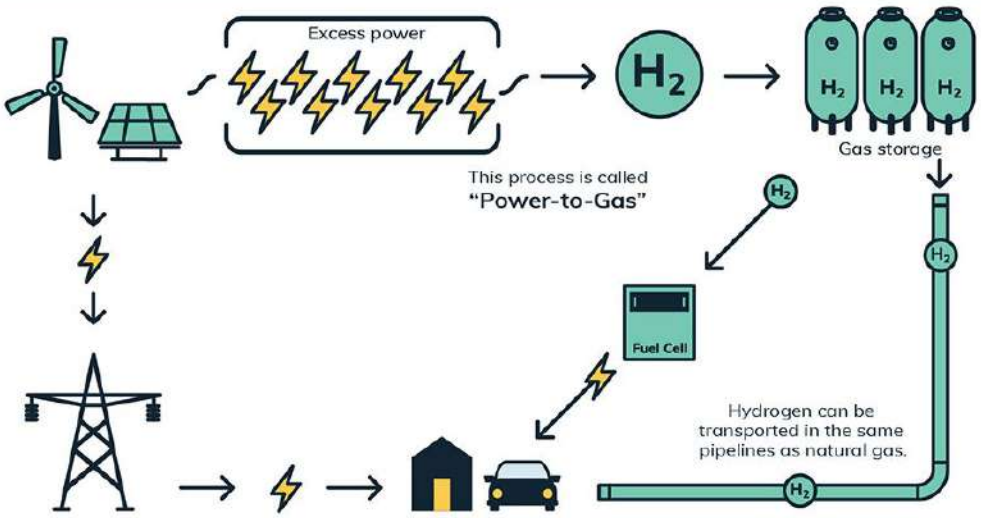
We can produce an averageof **140,233** kWh/year from oursolar system



CO2 is a naturally occurring chemical compound consisting of two oxygen atoms bonded to one carbon atom. Humans produce additional carbon dioxide by burning fossil fuels for energy. CO2 absorbs and reflects the earth's heat and increases the planet's surface temperature when emitted in excess. This effect is called global warming. Global warming can only be reversed by reducing the amount of carbon dioxide emissions.

VERSATILE APPLICATIONS

Power-to-Gas



Grid & Renewables Integration

Hydrogen acts as a **buffer** to increase **grid resilience**, and grid **balancing (matching supply to demand.)**

Large-scale renewable integration because it provides cost-effective long-term and seasonal storage. Lossless Distribution of energy across sectors and regions.

Renewable Energy Storage

- Hydrogen mountain shelter in the Col du Palet (2,600m)
- European islands gain energy independence and security by utilizing wind and solar power to create hydrogen. Isolated from the mainland, they are empowered to create their microgrid
  Example: The Orkney islands, from the Scottish archipelago

Backup Power

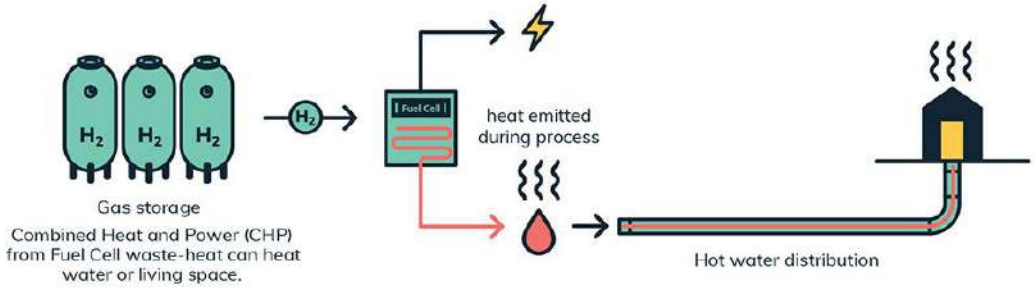
- Telecommunications industry
- Communication centers
- First response, hospitals
- Control center, traffic signals
- Disaster prone areas

Industrial Use

55 Million tons of hydrogen is used in refining, fertilizer, and chemical production.

Combined Heat and Power (CHP)

Hydrogen is a cost-effective option to decarbonize buildings' heat and power.



Combined Heat and Power (CHP) from Fuel Cell waste-heat can heat water or living space.

TECHNOLOGY HIGHLIGHTS

Find more at phisueahouse.com

1. Hydrogen Energy System

We have implemented a unique hybrid hydrogen and battery energy storage system to store excess power produced by solar panels during the day for later use.

2. KNX Automation

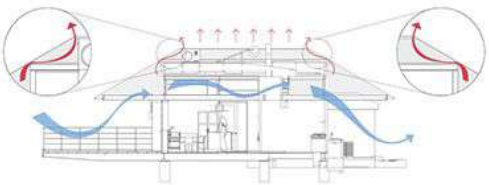
The trend towards building automation systems or smart homes is unstoppable due to the potential for energy saving and increased convenience. KNX is an open international building control standard that allows barrier-free integration and interoperability of products by any manufacturer.

3. Rainwater Collection System

To minimize our impact on the land we live on, we have designed and built a water collection system to save and reuse as much of the rain and irrigation water as possible. An extensive surface drain system collects water and leads it into larger conduits, from where it continues to flow only by gravity into our 1000m3 water reservoir. The water is then aerated and filtered before being reused around the site.

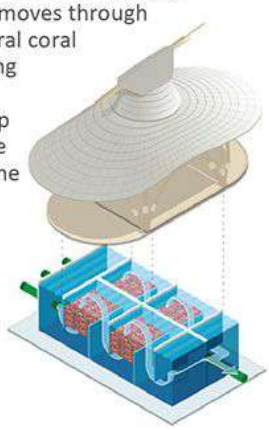
4. Windflow

Using basic physics – allowing hot air to flow freely up and out – we can keep rooms cool and notice a significant improvement in comfort. This design step incurs little cost but can yield great improvements and lower the energy demand for ventilation and cooling significantly.



5. Fish Pond

The 600m3 fish pond has been designed and constructed following a fully organic approach.
A solar-pump pumps water into the waterfall at the upper pond. The water runs through the rocky waterway into the lower pond. From here, gravity pushes water into a filter under the Bamboo Sala and then through the chambers of the filtering system. The water moves through sediment and natural coral filters before flowing back through long pipes into the pump room leading to the small waterfall at the upper pond.



6. Solar Water Heating System

Solar water heating systems are used to warm up water for bathrooms and kitchens. The hot water system works by circulating water in a tank through solar thermal collectors. As the water contained in the panel heats up, its density decreases causing it to be pushed upwards by cooler water from the bottom of the tank. A well-insulated solar water heating system can hold a very high temperature exceeding 80 degrees Celsius for several days.