Report on the technical examination the of the “KPP 100”

Thailand, Bangsaray, December 6th 2018

Explanation:

This report documents the results regarding the inspection of the KPP-Power-Plant technology of the installed “KPP100” power plant, property of the Save-The-Planet AG, at its location in Thailand. The power plant is installed on the premises of the R & D Farm at the Asia Holding headquarters in Thailand for the purpose of energetic self-sufficiency with electricity.

Scope and Purpose of the Examination:

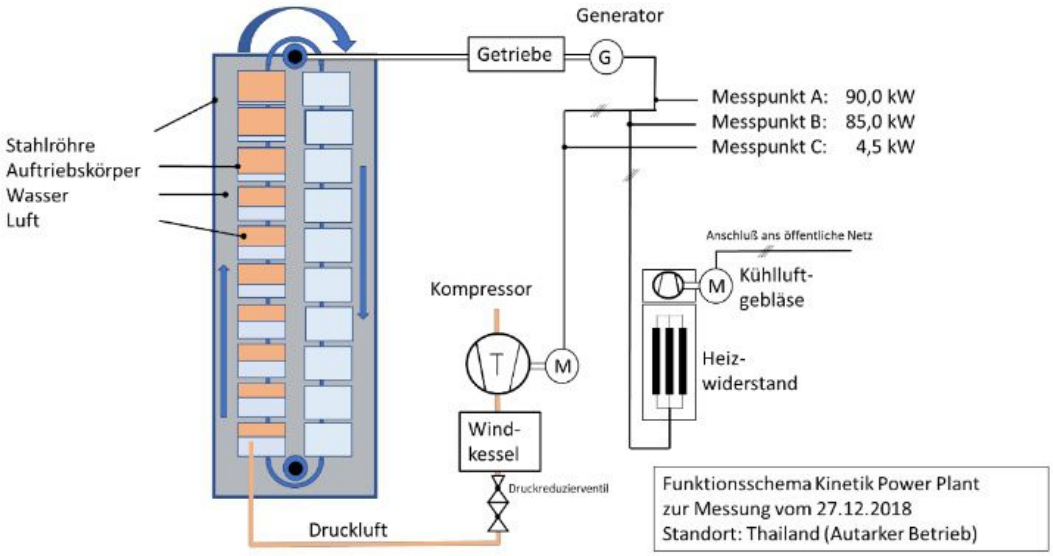
- Examination of the KPP-Power-Plant technology
- Examination of the environment and the area surrounding the KPP
- Metrological Examination of 2 operating states
    - Self-Sufficient isolated operation of the KPP / energy consumer heating resistor, Compressor
    - Self-Sufficient isolated operation of the KPP / heating resistor, compressor and the power grid of the farm
- Analysis of the Unique selling points

General Information

Location:	Save-The-Planet ASIA HOLDING LTD.
	211/12 Moo 6, 20250 Bangsaray, Sattahip, Chonburi, Thailand
Date:	November 26th 2018 and December 1st 2018
Power Plant:	KPP 100

Examiner No. 1:	Raimund Wunder, Dipl.Ing.
Examiner No. 2:	Jürgen Holper, Dip.Ing.(FH)

No.:	Activities:
1.	**Short Description: KPP Power-Plant** In the water-filled tube, 42 steel containers (buoyancy) run on two parallel endless-chains. These containers are filled with compressed air at the lower deviation point and, as a result, generate a buoyancy force. At the upper deviation point, the air is displaced from the containers by inflowing water, so that the rising containers are filled with air and the descending containers are filled with water. The air-filled containers each generate a buoyant force which is transferred in total via the chains to an overhead drive shaft. This drive shaft drives, via several chain ratios, a generator with a speed of 375 U / min. The compressed air is generated by a compressor, cached in a wind boiler of 300 ltr. and fed to the buoyancy bodies via a pressure reducing valve with a speed-synchronized valve technology. The compressor is driven by the power generated by the generator. The remaining excess energy is converted into heat by a heating resistor. The measurements were carried out under **two operating conditions**: 1. KPP with heat resistor, without external consumer 2. KPP with heat resistor and the power grid of an external user
2.	**Inspection of the environment and the area surrounding the KPP:** The power plant was built on the R & D, property of Save The Planet Asia Ltd. The farm is connected to the local power grid (400V, 50 Hz). Two emergency-generators serve as backup to compensate for the power failures which occur daily in Thailand. A second compressor, which is supplied by the public network, is placed next to the compressor which belongs to the plant,. It is only used for the first start-up of the system, since the system cannot supply itself with compressed air for the first start. It was checked and ensured that, during the entire test drives, the second compressor was not in operation and the two emergency generators were switched off and not connected to the mains. It was also checked and ensured that there is no connection between the public grid and the generators. The cooling fan of the heating resistor is connected to the public grid. A failure of the system, without further cooling of the resistor, would lead to thermal destruction.

3.	**Operating Status 1:** The compressor was driven by the power generated in the generator. The remaining excess energy was converted into heat by a heating resistor.
3.1.	**Measurement Setup of Operating Status 1:**  **Rated Data :** **Generator:** Rated Output: 100 kW Rated Voltage: 400 V Rated Current: 145 A Rated Speed: 375 U/min **Compressor:** Rated Output: 7,5 kW Nominal Flow Rate: 850 l/min Rated Pressure: 8 bar Rated Voltage: 400 V **Resistance:** Rated Resistance: 100 kW (staggered) Rated Voltage: 400 V
3.2.	**Measured Value for Operating Status 1:** **Measuring Point A: Generator (output):**

Time:	13:32	13:52	14:02
V1/2	385 V	386,7 V	386,2 V
V2/3	388 V	388,7 V	387,3 V
V3/1	386 V	387,3 V	388 V
L1	137,9 A	137,1 A	137,6 A
L2	133,4 A	132,6 A	132,8 A
L3	133,3 A	133,3 A	133,2 A
P	90,46 kW	90,06 kW	90,04 kW
S	90,46 KVA	90,01 KVA	90,04 KVA
Q	0 KVAR	0 KVAR	0 KVAR
F	49,9 Hz	50,1 Hz	50,1 Hz

Measuring Point B: Resistance (input):

Time:	14:06	14:16	14:21
V1/2	384,0 V	384,4 V	385,4 V
V2/3	387,3 V	386,4 V	386,7 V
V3/1	385,0 V	385,7 V	385,8 V
L1	127,7 A	129,3 A	129,1 A
L2	126,4 A	126,4 A	126,8 A
L3	128,4 A	128,8 A	129,1 A
P	85,5 kW	85,43 kW	85,60 kW
S	85,5 KVA	85,43 KVA	85,60 KVA
Q	0 KVAR	0 KVAR	0 KVAR
F	49,9 Hz	49,9 Hz	50,0 Hz

Measuring Point C: Compressor (input):

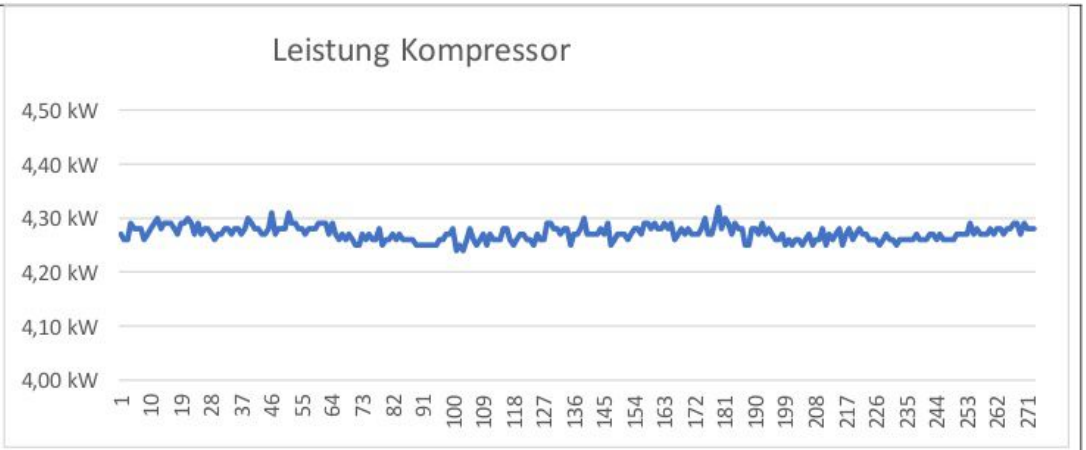
Time:	14:32	14:39	14:45

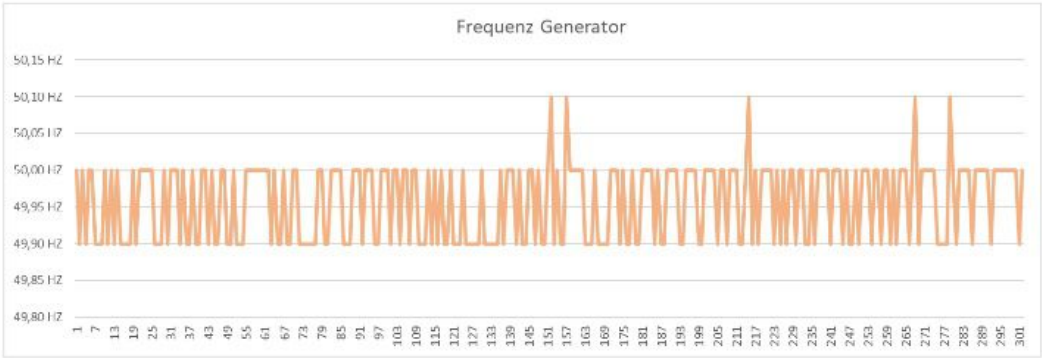
V1/2	385,0 V	385,1 V	384,1 V
V2/3	384,6 V	385,2 V	385,0 V
V3/1	384,8 V	383,9 V	384,3 V
L1	6,99 A	6,98 A	6,94 A
L2	7,07 A	7,05 A	7,03 A
L3	6,76 A	6,77 A	6,77 A
P	4,27 kW	4,28 kW	4,25 kW
S	4,61 KVA	4,61 KVA	4,60 KVA
Q	1,74 KVAR	1,75 KVAR	1,73 KVAR
F	50,1 Hz	49,9 Hz	49,9 Hz

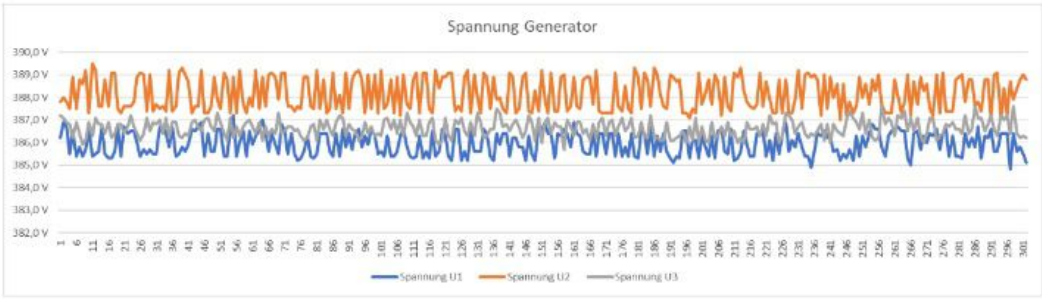
Note:

While the meter was connected to a measuring point, the plausibility was constantly checked at the other measuring points with a clip-on-amperemeter.

3.3. **Measurement Series Operating Status 1:**







3.4. **Results of Operating Status 1:**

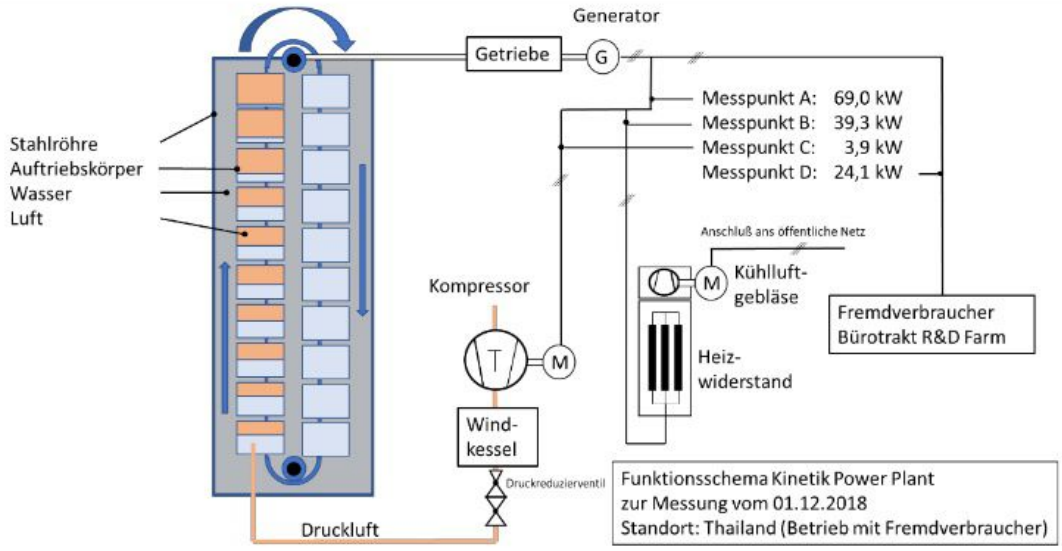
The system ran completely self-sufficient over the entire measuring period (from 13:10 to 15:40), without a connection to the public network on the energy side (generator, compressor, resistor). Only the fan of the resistor was connected to the public network as described and mentioned above.

The measurements document the functionality of the KPP technology system and show the following values over the measurement period:

Production of the Generator: 90 kW

Consumption by the Compressor: 4 kW

	Excess Energie (Resistance): 86 kW . The system delivers 90 kW over the measuring period, with a power consumption at the compressor of 4 kW a surplus power of 86 kW, which is supplied to the heating resistor.
4.	**Operating Status 2:** For this measurement, the power of the system was reduced to 70 kW by reducing the amount of air. With the power generated in the generator, the compressor was driven. Parts of the power generated was used to supply the office tracts of the farm. Thus, this part could be integrated into the system as a variable foreign consumer. The consumers in the office tract were mainly split air conditioners (indoor and outdoor units), computers, printers, telecommunication units and kitchen appliances. The remaining excess was converted to heat in the heating resistor.
4.1.	**Measurement Setup of Operating Status 2:**



Rated Data as of Operating Status 1

4.2. Measurement Value of Operating Status 2:

Time of Measurement:	**13:36**	**13:47**	**14:09**
Voltage:			
V12	381 V	383 V	381 V
V23	384 V	386 V	385 V
V31	383 V	384 V	383 V
Measuring Point A: Power Generation Generator Output			
L1	110,00 A	111,00 A	109,00 A
L2	97,00 A	98,00 A	96,00 A
L3	106,00 A	105,00 A	105,00 A
Measuring Point: Power Consumption Resistance			
L1	57,00 A	62,00 A	55,00 A
L2	60,00 A	57,00 A	60,00 A
L3	61,00 A	55,00 A	68,00 A
Measuring Point C: Power Consumption Compressor			
L1	5,80 A		
L2	5,90 A		
L3	5,70 A		
Measuring Point D: Power Consumption Office Tract R&D Farm			
L1	38,00 A	34,00 A	35,00 A
L2	25,00 A	28,00 A	25,00 A
L3	34,00 A	37,00 A	29,00 A

Note:

	While the meter was connected to a measuring point, the plausibility was constantly checked at the other measuring points with a clip-on-amperemeter.
4.3.	**Results of Operating Status 2:** Other than during the first measurement, the farm was switched parallel to the resistor and compressor and powered with electricity by them. During the measurement period, the farm was operated in island operation mode. There was no supply via the public supply network. **Production Generator: 69 kW** **Consumption Compressor: 3,9 kW** **Surplus Energy (Resistance): 41 kW to 55,6 kW** **Surplus Energy (R&D Farm): 24 to 9,5 kW** The fan of the resistance was still fed from the public supply network. The main load on the farm were the air conditioners which showed strong load fluctuations due to their two-point control over the measurement period. The system ran at reduced power with about 70 kW. The load of the compressor was almost constant at 3.9 kW. The power consumption of the farm varied between 9.5 kW and in the peak at 24 kW, the remaining residual load of the generator was consumed by the resistor. The frequency was between 49.9 and 50.1 Hz. The KPP delivered a power surplus of approx. 65 kW during this reduced operation mode, with a compressor output of around 4 kW and generator output of around 69 kW.

Summary:

The examiners come to the following conclusion based on the measurements carried out:

The results of the measurement regarding Operating Status 1 clearly show that the installed power plant is able to operate independently without any supply of external energy and has delivered a net excess power of approx. 86 KW over the measuring period.

The results of measurements regarding Operating Status 2 clearly show that, while operated in island-operation mode, the farm can be supplied only via the installed power plant. The grid-independent supply of the local home network with power generated by the KPP could be proven.

Due to the careful examination of the environment, any form of manipulation can be ruled out.

The KPP technology has the following characteristics in contrast to any other power plant technology:

- The operation of power plant technology neither requires the use of fossil fuels nor the use of external electricity.

- The KPP technology, unlike the known renewable technologies (solar energy, wind energy) has no dependence on the respective availability of sun or wind and is independent of any location.

- With a practical availability of 8760 h /, the KPP technology can clearly be classified as base loadable.

Bangsaray, December 6th 2018

Examiner 1 **Examiner 2**

[Raimund Wunder] [Jürgen Holper]

Raimund Wunder

- Geboren 6. August 1951 in Steinfeld, verheiratet, eine Tochter
- Abitur an der HTL für Maschinenbau in Klagenfurt
- Studium für Regelungstechnik an der TU Wien, Abschluss Dipl.Ing.
- Nach dem Studium Eintritt in die Siemens AG, Erlangen, Bau und Inbetriebsetzung von Kraftwerken und Hochspannungsnetzen
- 1990 - 2002 Volkswagen AG/VW Kraftwerk GmbH, Kraftwerksleiter Heizkraftwerk West und ab 1995 zusätzlich Leiter der Energiewirtschaft
- 2001 Leiter aller VW Kraftwerke Wolfsburg, Kassel, Hannover und Prokurist der Volkswagen AG Preussen Elektra AG oHG
- 2002 - 2017 Geschäftsführer der Volkswagen Kraftwerk GmbH, der Volkswagen Immobilien GmbH und des Gemeinschaftskraftwerks Hannover, Prokurist der Volkswagen AG
- Aufsichtsratsmandate: SkoEnergo, Volkswagen Varta Microbattery

Verbände:

2002 - 2017 Mitglied im VIK Vorstand

2012 - 2017 Mitglied im Vorstand des Klima- und Umweltausschusses des BDI

2013 - 2017 Vorsitz im Energieausschuss des VDA

2017 mit Erreichen der Altersgrenze alle Mandate bei Volkswagen und Funktionen in den Verbänden abgegeben

2017 bis 1/2018 Beratervertrag mit der Volkswagen AG für Energiepolitik

Jürgen Holper

- Geboren 22.März 1959 in Trier, verheiratet, zwei Töchter
- Fachabitur an der Fachhochschule für Technik in Trier, Fachrichtung Maschinenbau
- Studium für Versorgungstechnik an der Fachhochschule in Trier, Abschluss Dipl. Ing (FH)
- Nach dem Studium 4 Jahre Energieberatung in der Ingenieurgesellschaft für Rekuperatortechnik in Aachen. Danach 3 Jahre Planungsingenieur und Bauleiter für Heizung-, Lüftungs- und Klimatechnik bei der Franz van Eisern KG in Aachen.
- Anschließend 4 Jahre Teamleiter für Gebäudeautomation bei Landis und Gyr in Düsseldorf.
- 1992 bis 1996 Geschäftsführer und Gesellschafter der ECO2 Umweltingenieure in Aachen.
- 1996 bis 2010 Ausführungs – und Vertriebsleiter Siemens Düsseldorf.
- 2010 bis heute Gesellschafter und Geschäftsführer der der Ingenieur- und Planungsgesellschaft ECO2 Gmbh.
- 2014 bis heute Gesellschafter und Geschäftsführer der Vertriebs- und Projektentwicklungsgesellschaft HTL GmbH.

Sonstiges:

Mitglied des VDI seit 1981
Zugelassener Projektentwickler beim Bundesamt für Wirtschaft und Ausfuhrkontrolle
Zugelassener Energieberater Mittelstand beim Bundesamt für Wirtschaft und Ausfuhrkontrolle