The GEGENE Book

The Bifilar Coil Free Energy Generator

Written by:

Jean-Louis Naudin

Edited by:

Aaron Klein

Table of Contents

The GEGENE: A Great Efficiency GENErator with a Tesla Bifilar Coil

*Created on December 28, 2012 by **JLN Labs** - last update February 1, 2013*

Edited by: Aaron J. Klein, 2023

Here is an interesting experiment about a high power electrical generator which is able to produce some kilowatts. It uses the electronic controller of an induction cooker which can be purchased in any store for less than 80 €. The main specification of the GEGENE (Great Efficiency GENErator) is that it uses a BIFILAR PANCAKE COIL patented by Nikolas TESLA in 1894 in the patent N° 512,340.

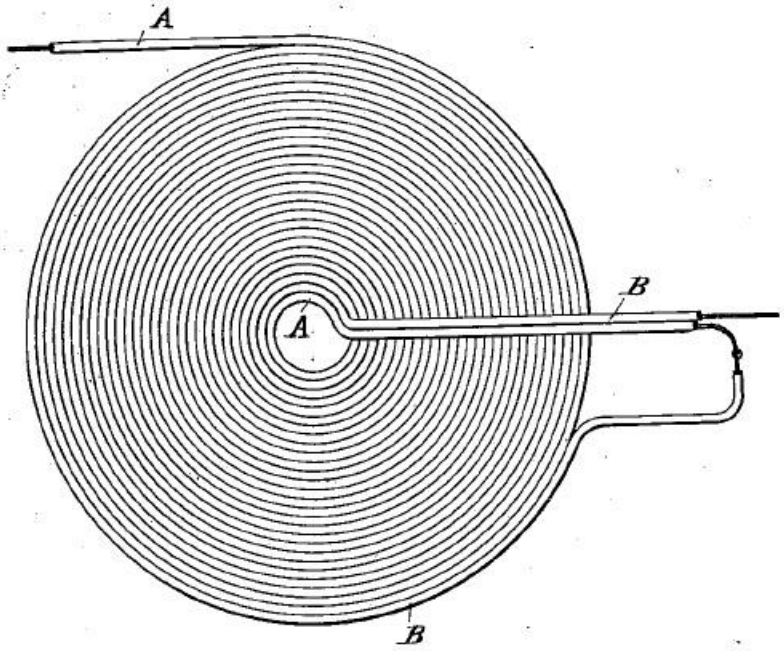
(No Model.)

N. TESLA.

COIL FOR ELECTRO MAGNETS.

No. 512,340. Patented Jan. 9, 1894.

Fig. 2



Witnesses
Raphaël Netter
James N. Catlow.

Inventor
Nikola Tesla
By his Attorneys
Duncan & Page.

Introducing the Project

In the GEGENE, the flat bifilar coil is electromagnetically coupled with the main flat coil of the induction cooker and acts as the secondary coil for the output. The driving and the controlling are fully done by the main electronic controller of the induction cooker itself. So, no special electronic equipment or laboratory measurement tools are required here

to succeed in this experiment. You need only: an induction cooker, a dual flexible wire (speaker wire or grid wire) and some electrical connectors and plugs. At the GEGENE output you must connect resistive and non-inductive loads such as halogen lamps. The total load power at the output must be at least 1500 W or more.

Here is a video of the FULL TEST of the GEGENE:

https://youtu.be/hI07DLlG3Qg

I highly recommend you watch this video, below:

Comparison of Tesla Bifilar and Pancake Coils:

https://youtu.be/mvb39SwTXBE

Link and references:

- Vladimir Utkin's Free-Energy Secrets - March 2012
- A Special Case of Voltage Gain by Oliver Nichelson
- NIKOLA TESLA'S LATER ENERGY GENERATION DESIGNS by Oliver Nichelson
- The Nikola TESLA patent N° 512,340 "Coil for electromagnets" patented Jan 9, 1894

Below are some video links (in Russian) of similar experiments done by the FreeEnergyLT team:

- Video 1: indukcion free energy
- Video 2: IN 230 v /4.3 a / 900 W OUT 2.3 KW FREE ENERGY

The GEGENE: The Main Power Source

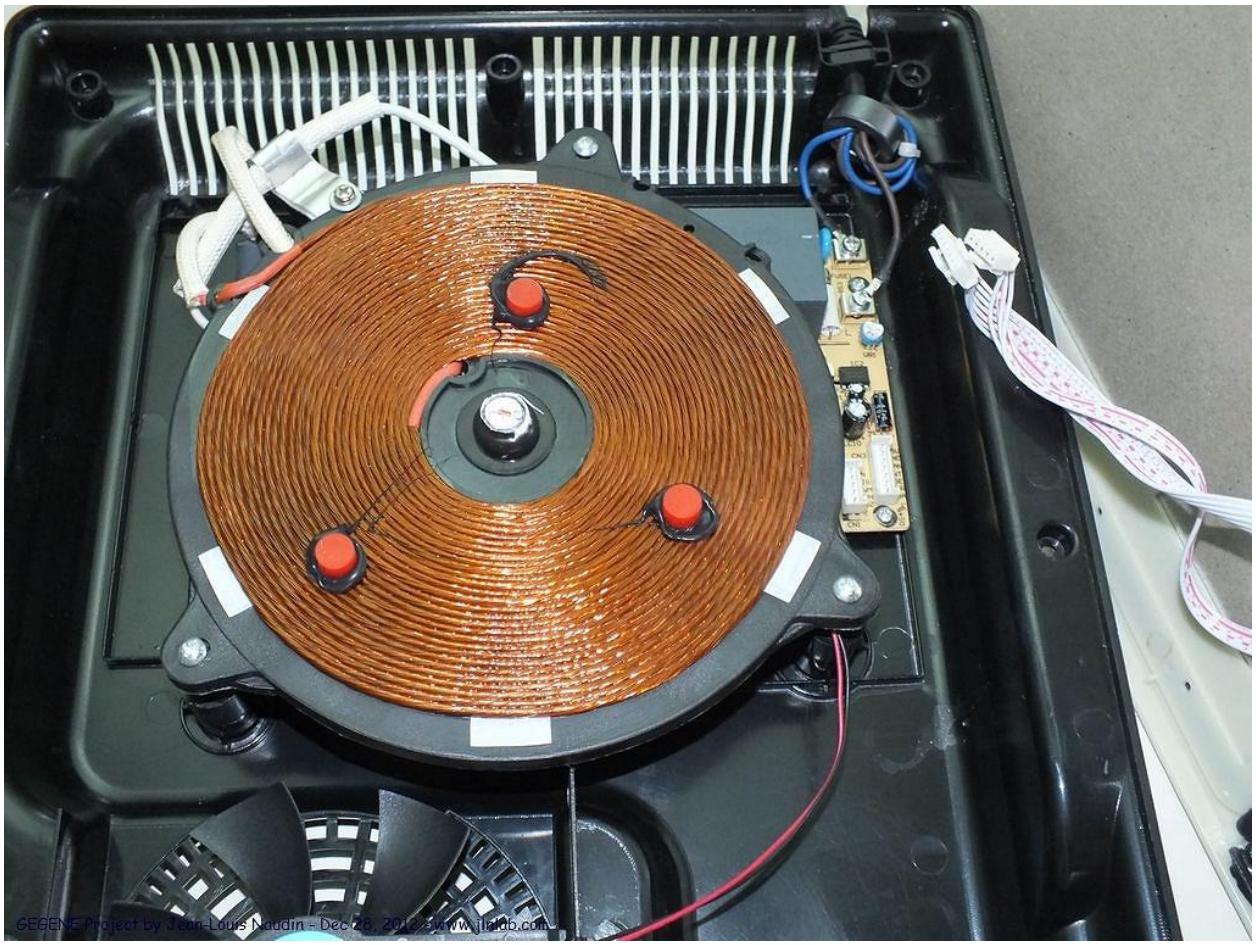
1 - The Main Power Source for the GEGENE

In the GEGENE, the flat bifilar coil is electromagnetically coupled with the main flat coil of the induction cooker and acts as the secondary coil for the output. The driving and the controlling are fully done by the main electronic controller of the induction cooker itself. So, no special electronic equipment or laboratory measurement tools are required here to succeed in this experiment. You need only: an induction cooker, a dual flexible wire (speaker wire or grid wire) and some electrical connectors and plugs. At the GEGENE output you must connect resistive and non inductive loads such as halogen lamps. The total load power at the output must be at least 1500W or more.

Here above the device that I have used for this experiment, this is a 2000 Watts induction cooker from UNOLD with the ref 58235.
I have found it on the net for less than 60 €.

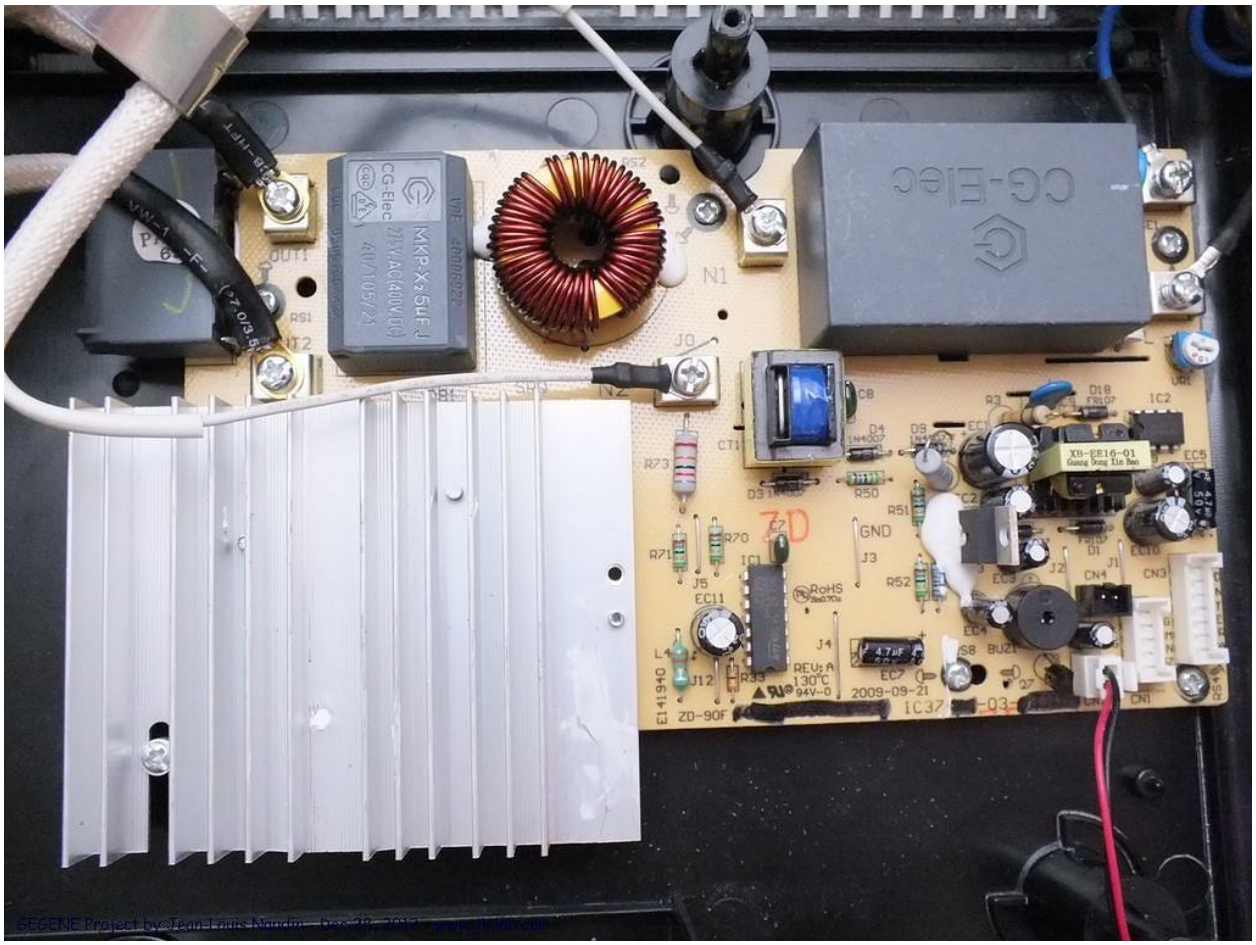
Here below, the inside view of the induction cooker:

Below, the flat coil used as the primary coil for the GEGENE.



In normal condition, the induction cooker uses the Foucault currents to produce heat in the ferromagnetic vessel (the pan) placed above the coil. This flat coil is built with LITZ wires. The use of the LITZ wires allows it to have flexible wires and no specific cooling, the losses by skin effect are greatly reduced with Litz wires.

The electronic control board of the induction cooker is used without any change, it contains all the components required to succeed in the GEGENE experiment. I recommend to use a tunable induction cooker but in most cases it has such a feature.



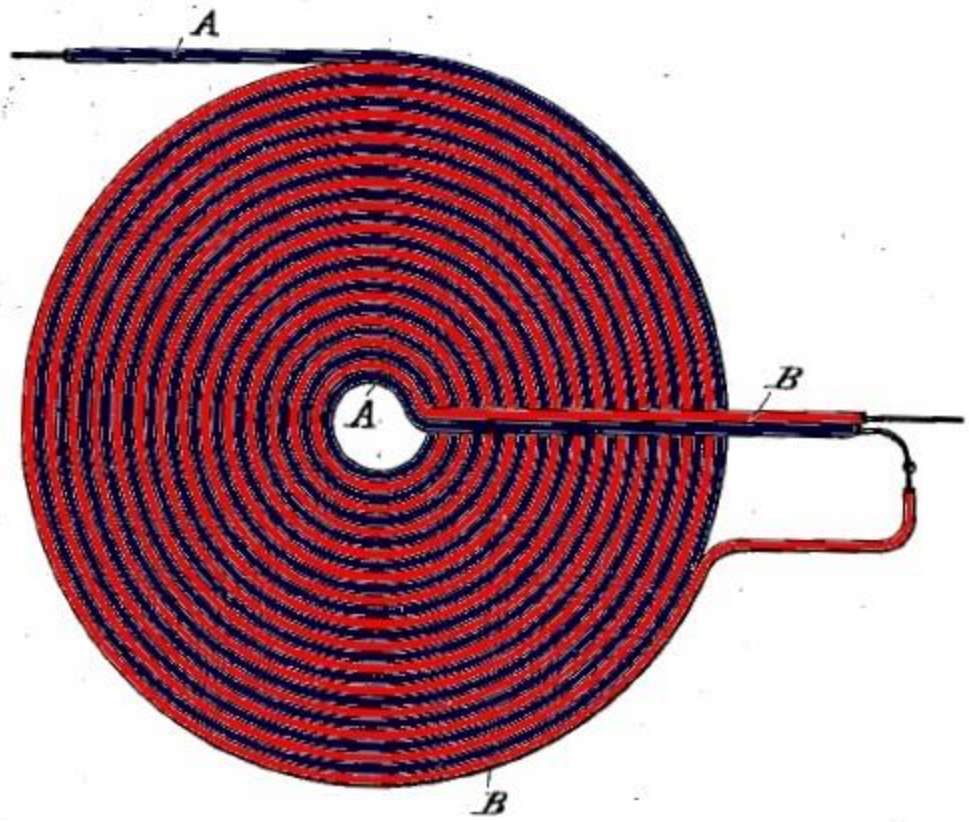
Next step:

How to build the Tesla bifilar output flat coil

The GEGENE: How To Build the Tesla Bifilar Flat Coil

2 - How to build the output coil for the GEGENE

As pointed in the chapter 1, the output coil used for the GEGENE is a Tesla flat bifilar coil. The coil is built with a dual flexible wire (speaker wire) 2 x 0.75 mm^2. Here is the connection diagram of the coil from the Nicolas Tesla patent N° 512,340:



The output A and B are directly connected to the resistive and non inductive loads.

As the mounting base of the coil, I have used a wooden plate, 3 mm thick and 180 x 180 mm wide. The outer diameter of the coil is 160 mm (same diameter than the flat coil of the induction cooker). There are 16 turns of speaker wire, the wire is fixed on the plate with cyanoacrylate glue during the building. You must separate the wires while you build the turns due to the curved shape of the flat coil.

Below, the Tesla bifilar flat coil ready to be used...

Look at carefully how I have connected the wires at the output.

Next step:

About the LOAD connected at the OUTPUT

The GEGENE: About the LOAD Connected at the OUTPUT

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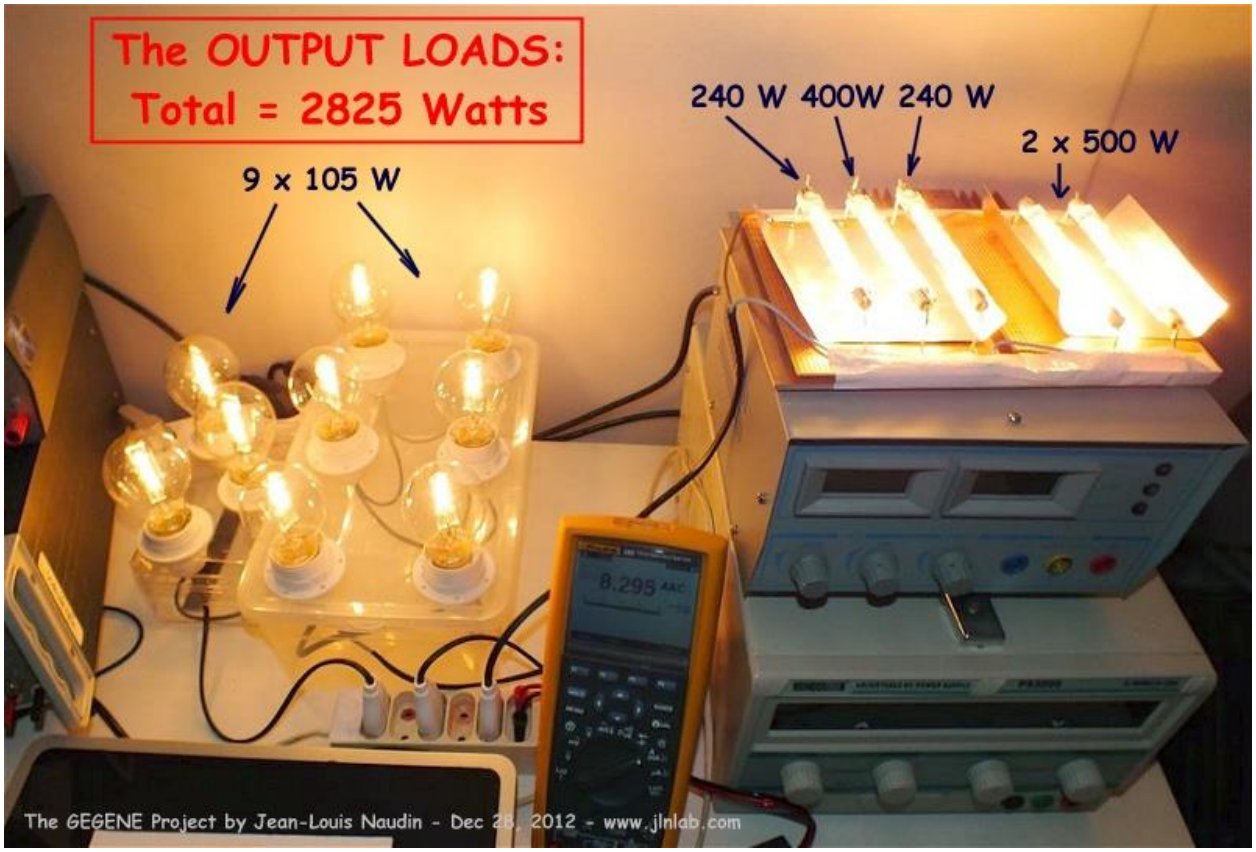
3 - About the LOAD connected at the OUTPUT of the GEGENE:

Concerning the load connected at the GEGENE output, you must use resistive loads such as halogen lamps and compatible with your country grid line (i.e., 220V in France). Don't use devices which have an electronic board inside because they don't work when they are connected at the output. Below, the setup that I have used for the testing:



You must connect at the coil output at least 1500 W otherwise the system will stall with the E0 error code and will bip.

The major interest of using halogen lamps at the output is that you get a good idea of the power flow in real time. This will allow you to compare the light intensity either powered by the GEGENE or directly connected to the main power grid. So, you don't really need to have special measurement tools to do this experiment by yourself.

Next step:

How to use and test yourself the GEGENE

How to Use and Test Yourself the GEGENE

*Created on December 28, 2012 - **JLN Labs** -Last update December 30, 2012*

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4 - Use of the GEGENE:

After having connected the load to the Tesla bifilar coil through some electrical plugs, put the coil on the middle of the induction cooker. Push the start/stop button and then the "function" button. By default, the delivered power on my induction cooker model is 2000 W; this is too much for this experiment. Reduce the power to 1000 W with the (-) button.

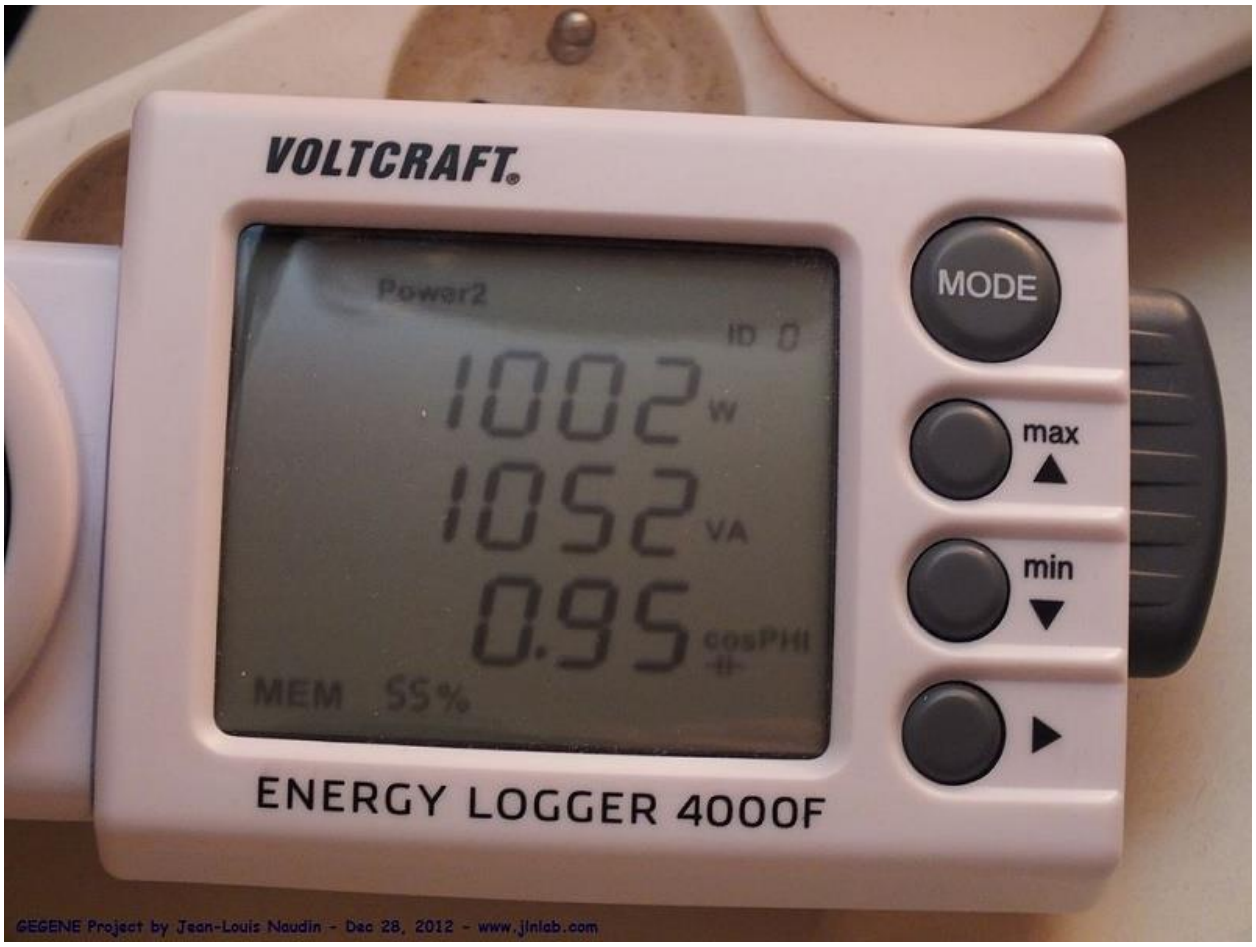
At the beginning, the LCD shows the E0 error code (No cookware on the plate, cookware not fitted for induction) with a "bip." To build up the EM coupling of the output coil, you need only to place temporarily a sheet of magnetic metal (180 x 180mm) or a magnetic cookware above the coil and in the middle of the induction cooker. When the output lamps are lit you must remove quickly the metal sheet because this metal sheet will heat up very fast. Never maintain the cookware or the metal sheet on the induction cooker in this experiment. If everything has been done correctly the halogen lamps will light at high power. You may move the output coil so as to get the maximum of light output. The flat bifilarTesla coil doesn't heat too much and you may move it without any problem with your hands.

So, the GEGENE is ready to give you the max electrical power at its output...

Disclaimer : **BE CAREFUL, USE EXTREME CAUTION** !!!, this device uses **High Voltage**, **ALWAYS switch off and disconnect the induction cooker before** touching the induction plate or the output coil. **Never touch the OUTPUT loads** (lamps, heater, boiler) while the induction cooker is working. **This experiment is not intended for the inexperienced**. User of this document should be very careful and experienced in High-Voltage electronics to try anything out! If you do it the risk of any results is just yours. I take no responsibility of anything that might happen. **This experiment is not intended for the inexperienced**. User of this document should be very careful to try anything out ! If you do it, the

risk of any results is just yours. I take no responsibility of anything that might happen, let it be of a wrong information or anything else.

I have connected a wattmeter on the electrical plug of the induction cooker, it measures 1002 W at the INPUT, so it is fully in line with the programmed power of 1000 W:



Here a video of the preliminary test of the GEGENE

https://youtu.be/4W2ABWjeTrk

Here, we are at the genesis of this project, I still have many tests and measurements required to validate these impressions overpower output. For the moment the observations are very interesting and worth to be developed deeply... Be patient and Stay tuned...

Efficiency Measurements Test #1 with a Lightmeter

*Created on December 28, 2012 - **JLN Labs** - last update December 30, 2012*

Dec 30, 2012 - TEST #1 results: This is the first efficiency measurement done with a lightmeter. I have used a Voltcraft Luxmeter LX-1108 for measuring the light intensity of the halogen lamps connected to the OUTPUT while the electrical power is measured with a Wattmeter, a Voltcraft Energy Logger EL4000F.

Here is the method that I have used for the TEST #1:

1. The GEGENE is connected to the power grid through the Wattmeter, the power of the induction cooker is programmed for a 1000W output. The GEGENE is started and then the light intensity is measured with the lightmeter and the electrical input power is noted as Power1.

2. The GEGENE is switched off and disconnected from the Wattmeter.
3. The halogen lamps are connected at the output of a VARIAC. The Variac is connected to the power grid through the Wattmeter.
4. The VARIAC is tuned so as to get the SAME light intensity as measured before with the GEGENE.
5. The electrical input power with the VARIAC is noted as Power2.
6. The efficiency is calculated as follows :

EFFICIENCY % = (Power2 / Power1) * 100

Below the setup used for the TEST #1

Here is the video of the Test #1 of the GEGENE

https://youtu.be/Iik6XnT2mE4

TEST #1 RESULTS:

In spite of these results giving a measured efficiency of 91.4 % with the lightmeter, it may be that the parameters were not really optimal, particularly the positioning of the bifilar output coil. I shall soon conduct new tests and measurements of the efficiency with another method.

This is only the beginning of the GEGENE project, more tests and improvements are soon coming.

Next Test:

TEST #2 : Efficiency measurements with a digital Oscilloscope

Stay tuned

TEST #2: Efficiency Measurements with a Digital Oscilloscope

*Created on December 28, 2012 - **JLN Labs** - last update January 2, 2013*

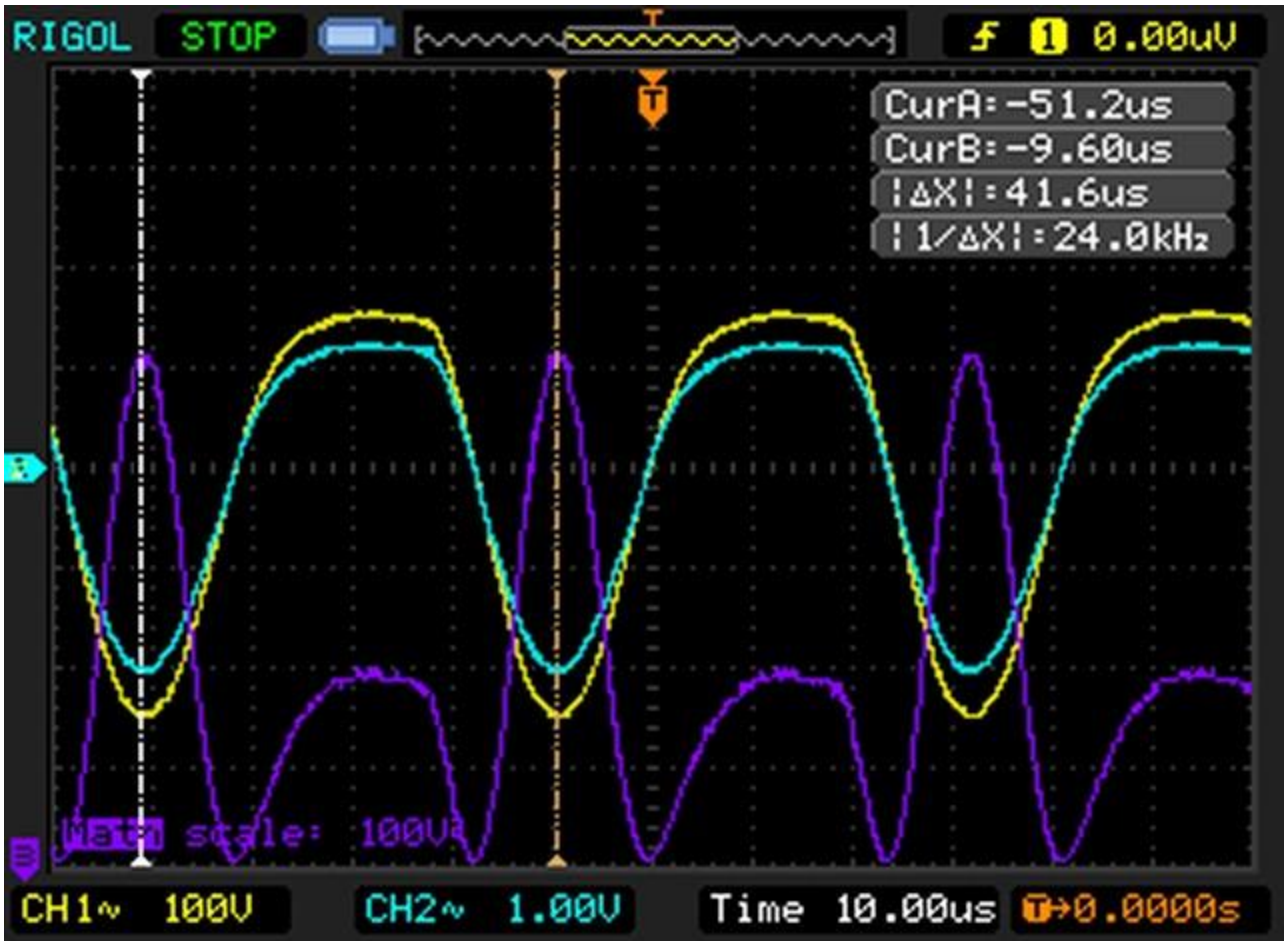
December 31, 2012 - TEST #2: Here are the results of the 2nd series of tests with a digital oscilloscope. The two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current i.e., the voltage across a 0.1 Ohm non-inductive resistor, a Mundorf MR10 10W. Then the data are sent to a datasheet to compute true RMS values and the efficiency. The electrical power input of the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid.

Below the setup of the TEST #2:

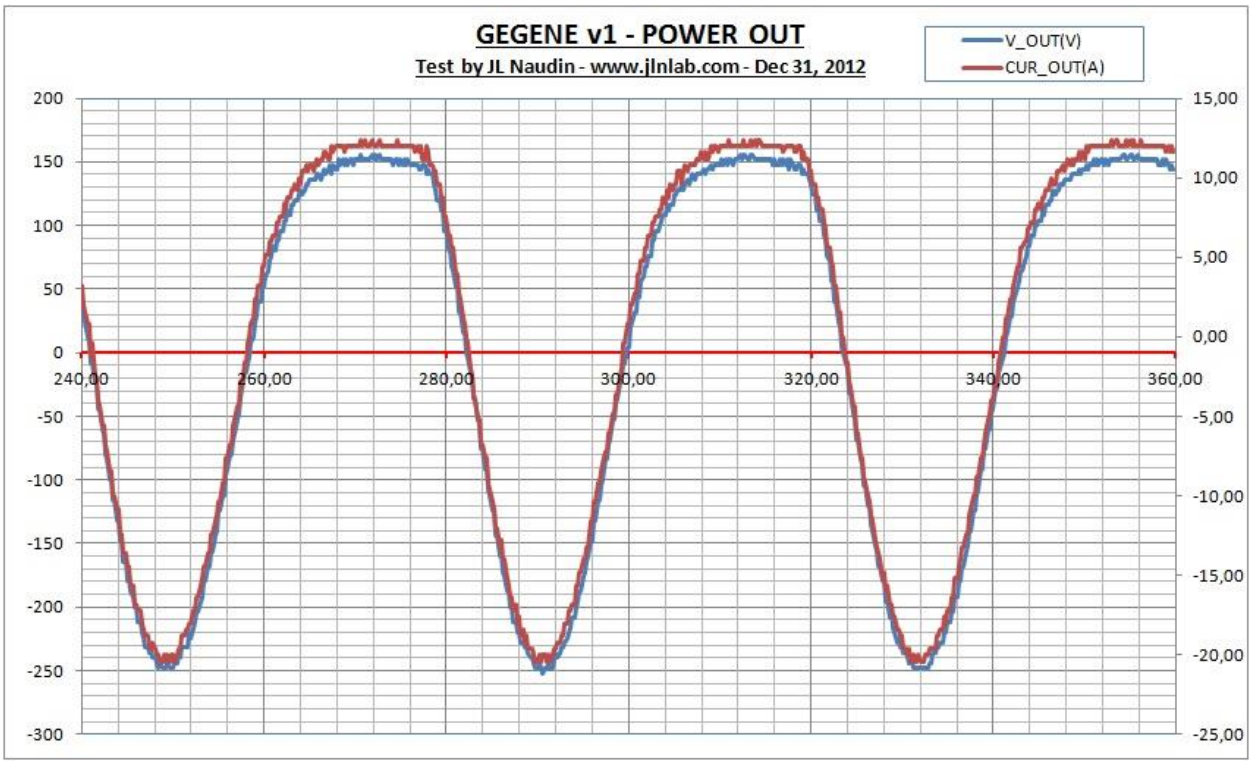
TEST #2 RESULTS:

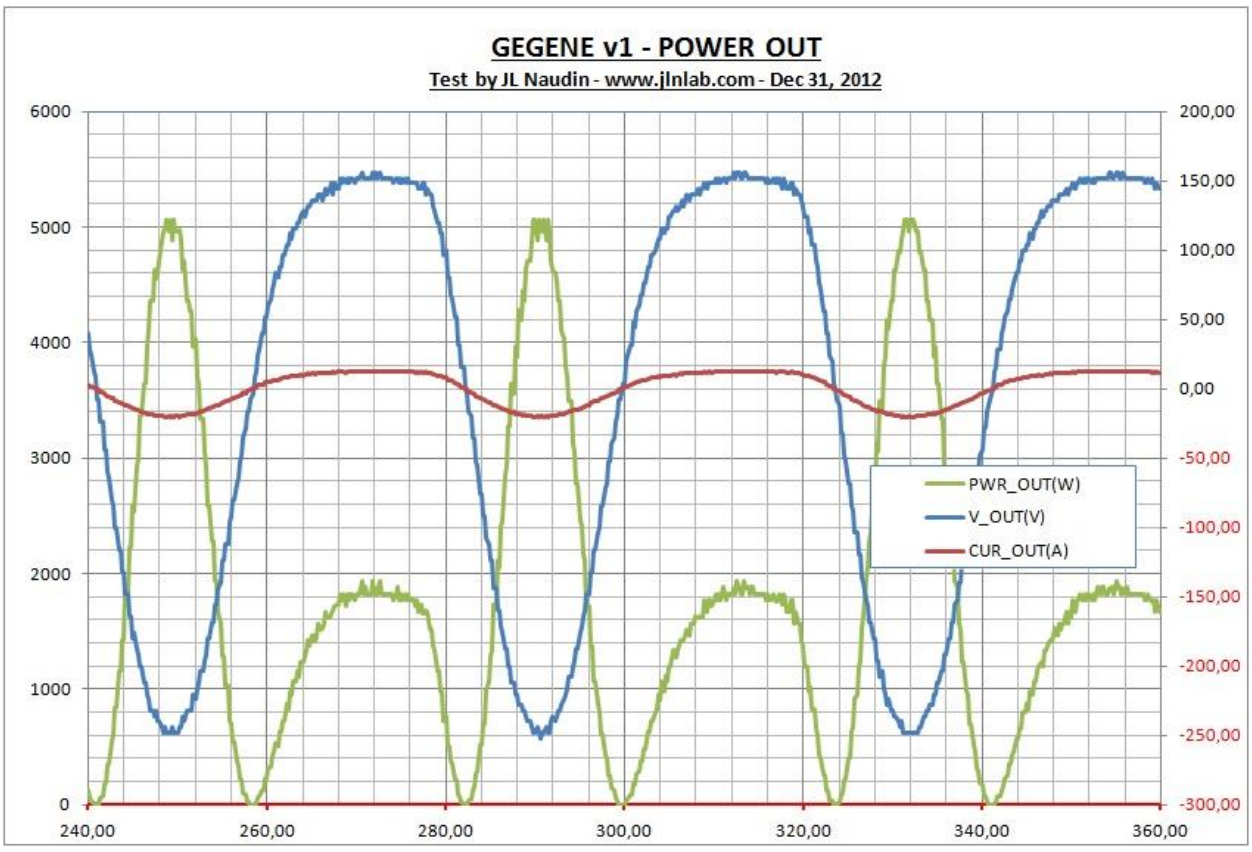
Of course, the voltage, the current and the power are true RMS values...


RIGOL
STOP
0.00uV
CurA:-51.2us
-9.60us
|ΔX|:41.6us
|1/ΔX|:24.0kHz
scale: 100V
CH1 100V
CH2 1.00V
Time 10.00us
0.0000s
The GEGENE Project by Jean-Louis Naudin - Dec 31, 2012 - www.jlnlab.com

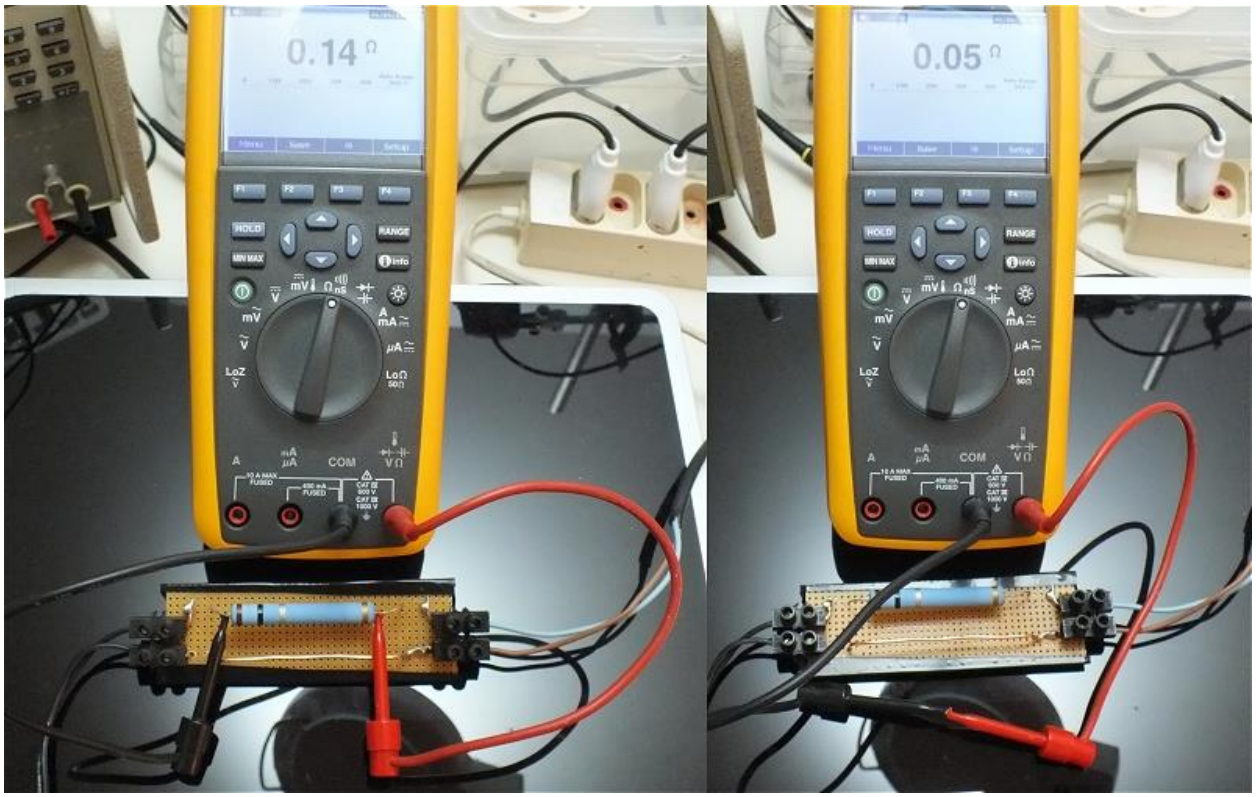


You may download the full data of the digital scope HERE.

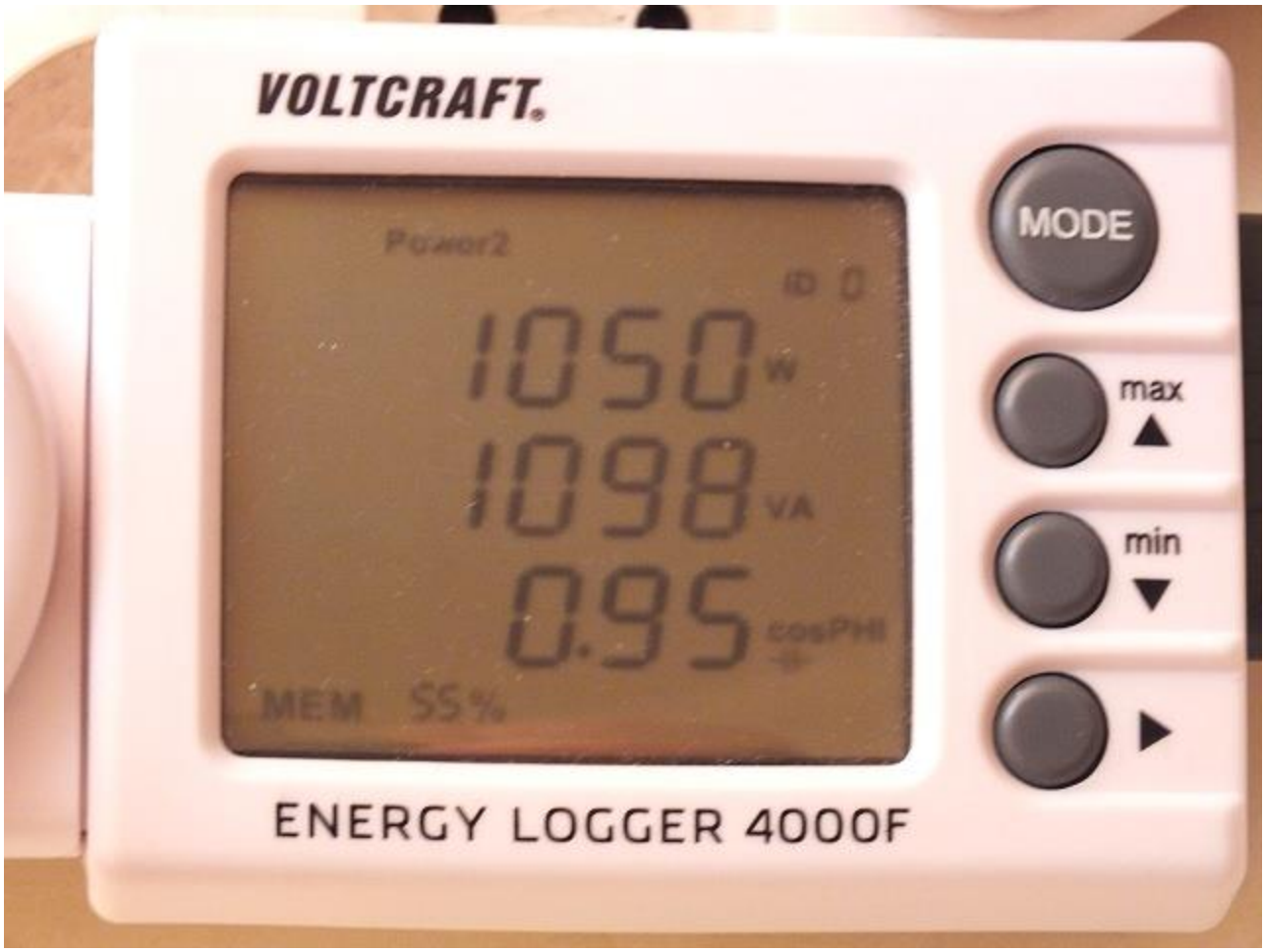

GEGENE v1 - POWER OUT
Test by JL Naudin - www.jlnlab.com - Dec 31, 2012
V_OUT(V)
CUR_OUT(A)
200
150
100
50
0
-50
-100
-150
-200
-250
-300
15,00
10,00
5,00
0,00
-5,00
-10,00
-15,00
-20,00
-25,00
240,00
260,00
280,00
300,00
320,00
340,00
360,00


GEGENE v1 - POWER OUT
Test by JL Naudin - www.jlnlab.com - Dec 31, 2012
6000
5000
4000
3000
2000
1000
0
200,00
150,00
100,00
50,00
0,00
-50,00
-100,00
-150,00
-200,00
-250,00
-300,00
PWR_OUT(W)
V_OUT(V)
CUR_OUT(A)
240,00
260,00
280,00
300,00
320,00
340,00
360,00

Here are the accurate measurements of the non inductive resistor Mundorf MR10 of 0.1 ohms 10W. The true value is 0.09 Ohms.



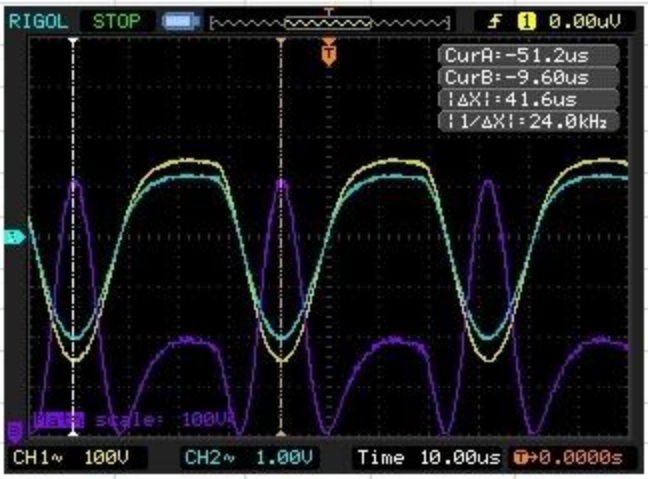
The electrical power for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid:



The Wattmeter measures 1050 Watts at the INPUT, this is fully in line with the 1000 Watts programmed on the induction cooker.

So, the true RMS voltage and the true RMS current computed with the data measured with the digital oscilloscope are:

The GEGENE v1 test by Jean-Louis Naudin (www.jlnlab.com)



TEST 2	31/12/2012
OUTPUT (rms)	
VTG(rms)	
149,77	
CUR(rms)	Rprobe
13,45	0,09
PWR_INP (W)	1050

The current probe resistor is NON INDUCTIVE

Current probe : Mundorf resistor MR10 - 10 Watts 0,1 Ohm (real value = 0,09 Ohm)

Here is a video of the FULL TEST of the GEGENE:

https://youtu.be/hI07DLlG3Qg

See also the additional test:

TEST #5 : New efficiency measurements with an oscilloscope and more power at the output

Stay tuned.

NEXT TEST:

TEST #3 : Efficiency measurements with a calorimetric method

TEST #3: Efficiency Measurement with a Calorimetric Method

*Created on 28 December, 2012 - **JLN Labs** - last update 2 January 2013*

January 2, 2013 - TEST #3: Here is the result of the 3rd series of measurements using a calorimetric method. For measuring the electrical power at the output of the flat bifilar coil, I have connected an electrical kettle and I have applied a calorimetric conversion method. I have used a 2400 W electric kettle (1.7 liter) from Moulinex "subito" model, ref BY530D30. The kettle is filled with 1000 mL of water and its temperature is measured with an immersed thermal probe connected to an electronic thermometer HFT81 Bioblock. The duration of the heating is measured with a chronometer. The electrical power input for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid.

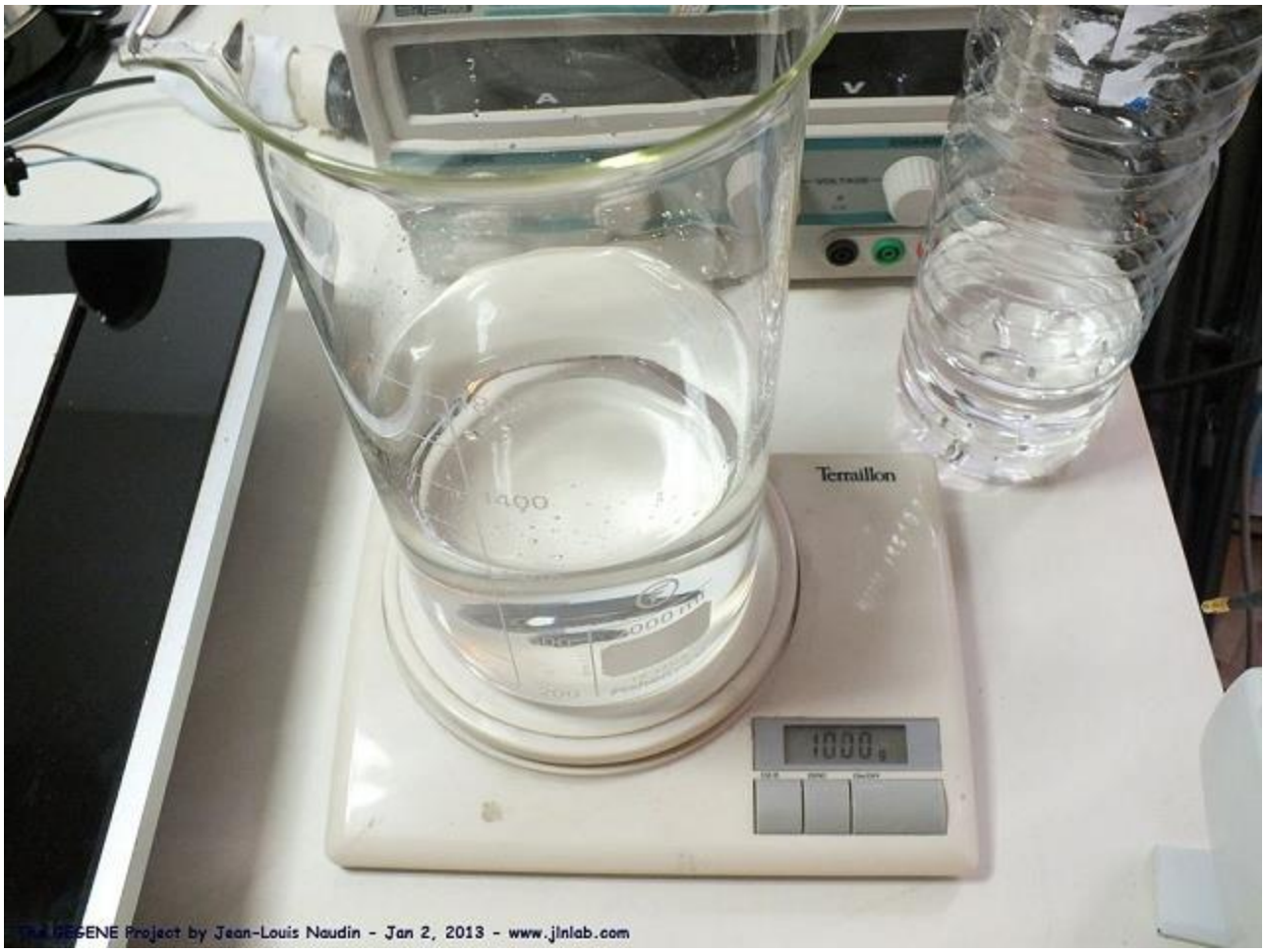
Below the TEST #3 setup:

The tools required for the TEST #3 are: a grid Wattmeter, an electronic thermometer, a chronometer and a calculator...

and of course an electric kettle...

1 - <u>Calibration: efficiency measurement of the electric kettle</u>

Before proceeding to the measurement of the power at the output of the flat bifilar coil, a calibration phase is required. The measurement of the efficiency of the electric kettle is required. So, I have simply connected the kettle directly to the power grid via the Wattmeter. The kettle is filled with 1000 g of water (1000 mL).



The kettle is filled with 1000 mL of water and the thermal probe is immersed in the liquid.

The method is simple : We need 4180 Joules of energy to heat 1000 g of water up to 1°C. So, it is easy to calculate the energy required to heat up the water and thus to compute the efficiency knowing the electrical energy required to power the kettle. For instance, the energy efficiency to heat up 1000 mL of water from 20°C to 100°C is 80 times 4180 Joules.

Below, the calibration phase:

Below the efficiency measurement of the electric kettle:

- Amount of water = 1000 g or 1000 mL
- Initial temperature Ti = 14.5°C
- Final temperature Tf = 96.6°C
- ΔT = Tf - Ti = 82.1 °C
- Heating duration t = 227 seconds
- Electrical Power at the input = 2100 Watts

Energy required to heat the water : W_{therm} =

4180 * 82.1 = 343178 Joules

Input electrical energy: W_{elec} = 2100 * 227 = 476700 Joules

Efficiency of the kettle = W_{therm} / W_{elec} = 343178 / 476700 = 0.7199

the efficiency of the electrical kettle r = 72 %

The correction factor, due to the loss in the kettle, to be applied is : 1/r = 1.38908

2 - Efficiency measurement of the GEGENE with the calorimetric method

Now that we have the thermal correction factor, the electrical kettle is connected to the output of the flat bifilar coil and the electrical power of the induction cooker is measured with the Wattmeter connected on the power grid.

The kettle is filled again as previously with 1000 mL of cold water and the induction plate is programmed to provide 1000 W.

Here the efficiency measurements results:

- Amount of water = 1000 g or 1000 mL
- Initial temperature Ti = 12.7°C
- Final temperature Tf = 96.6°C
- ΔT = Tf - Ti = 83.9 °C
- Heating duration t = 591.7 seconds
- Electrical Power at the input = 855 Watts

Energy required to heat the water: W_{therm} = 4180 * 83.9 = 350702 Joules

Electrical energy, really used by the kettle, and provided by the bifilar coil :
W_b = 350702 * 1.38908 = 487153 Joules

Input electrical energy: W_{elec} = 855 * 591.7 = 505903 Joules

Efficiency of the Gegene = W_b / W_{elec} = 487153 / 505903 = 0.9629

The efficiency of the Gegene with the calorimetric method is 96 %

Next Test:

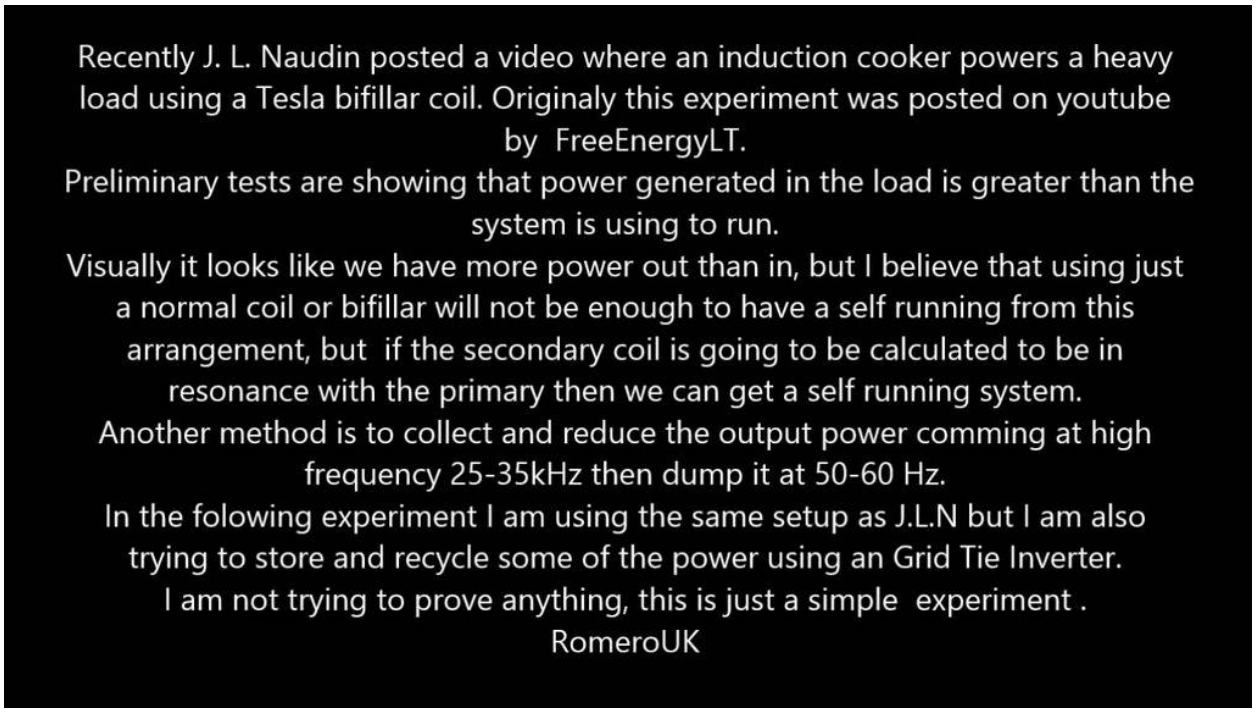
TEST #4: First test of a **closed loop GEGENE** by "Romero UK"

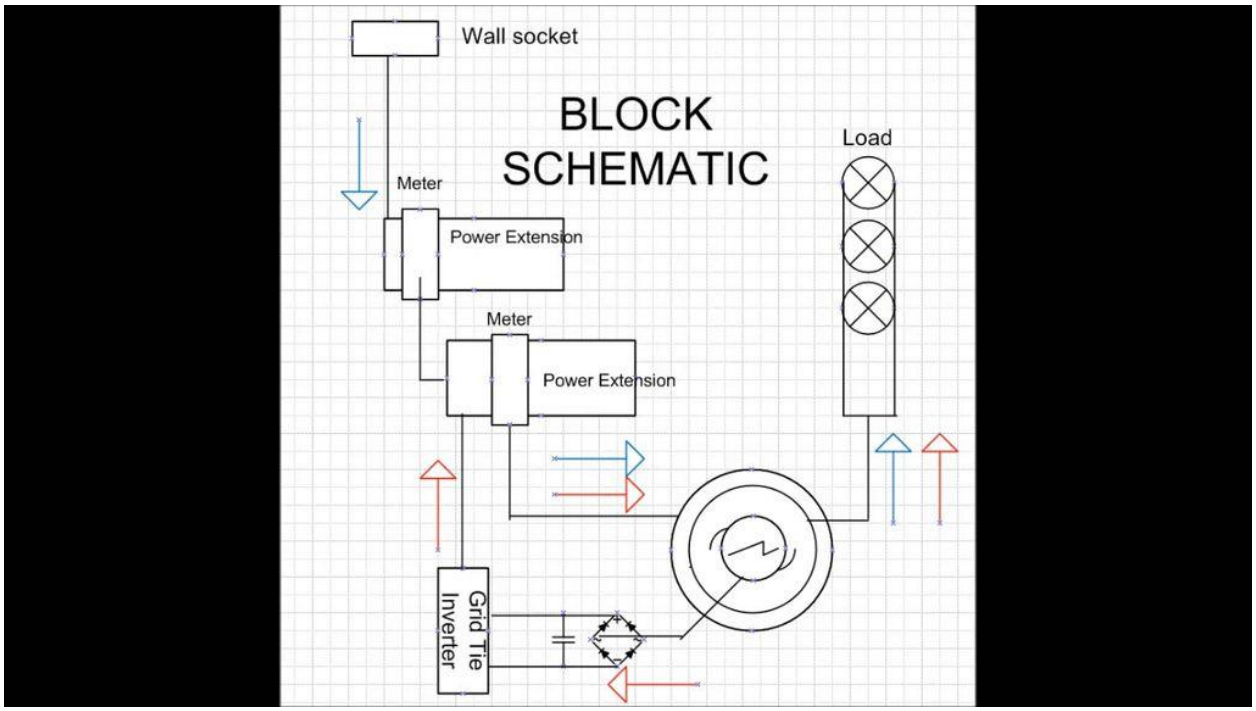
TEST #4: First Test of a Closed Loop System with the GEGENE by "Romero UK"

January 3, 2013 - TEST #4: Here is a very interesting test done with the GEGENE by "**Romero UK**". This is the first attempt of a closed loop generator by using a 350W GTI (Grid Tie Inverter) for reinjecting the excess of power at the input of the induction cooker. The flat bifilar Tesla coil is connected on the halogen lamps as the loads like in a classical setup of the GEGENE, but "Romero UK" has added an additional coil to tap the excess of energy and close the loop via the GTI connected on the power grid. It is very interesting to observe that the system is able to synchronize itself at an optimal point and begins running stable. "Romero UK" has demonstrated in his test that the GEGENE is able to light all the halogen lamps at the output while 150W of additional power is reinjected to its input. So this test demonstrates that a closed loop system is now possible.

Congratulations to **"Romero UK"** for this excellent and ingenious experiment.

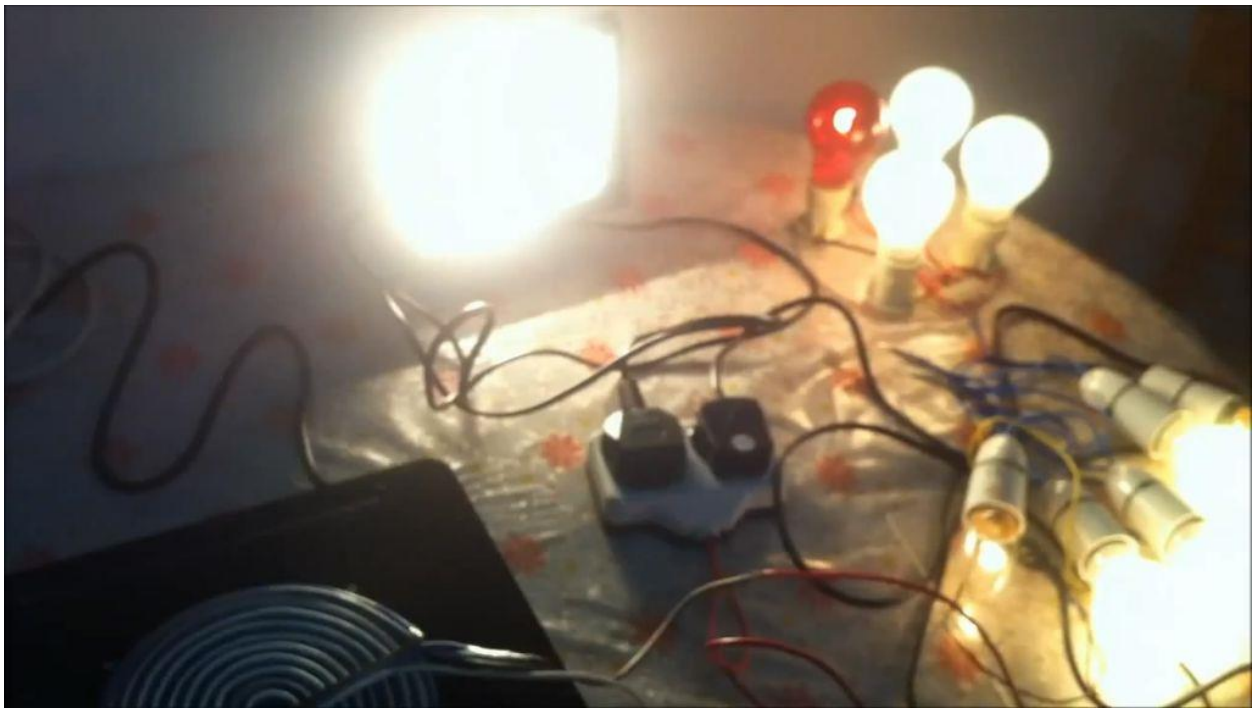
Below some screen shots of the "Romero UK" about the closed loop tests of the GEGENE:

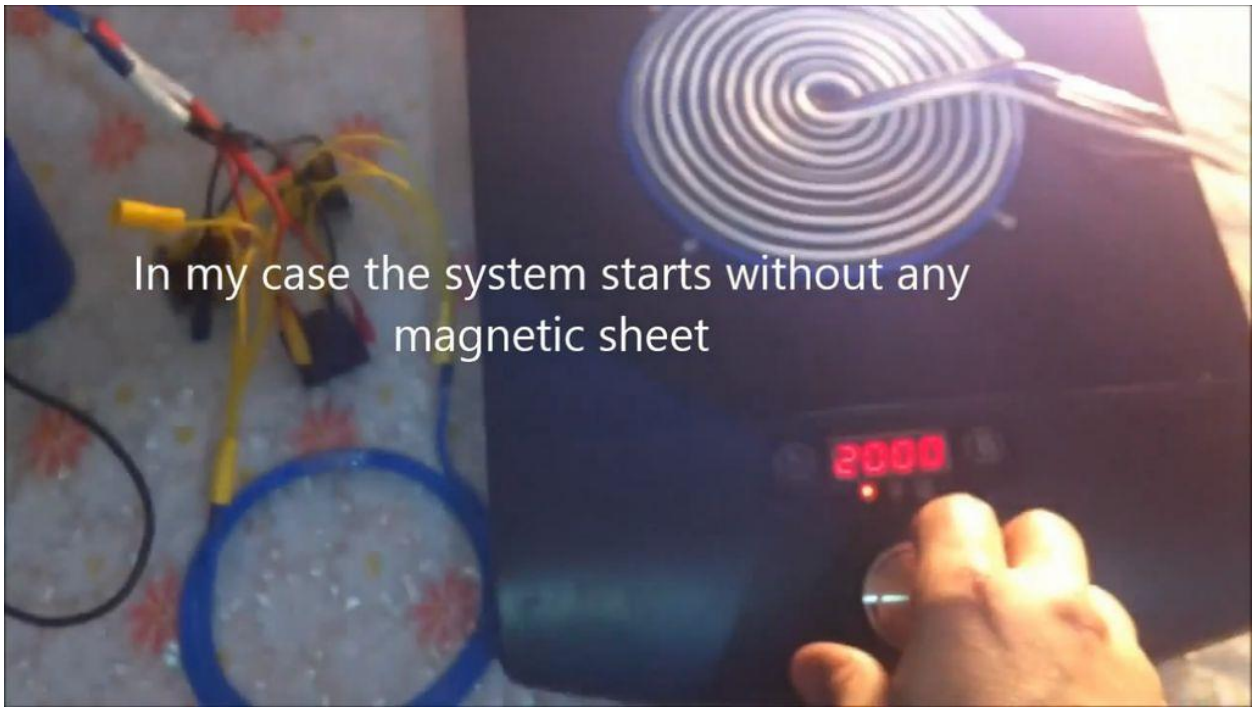


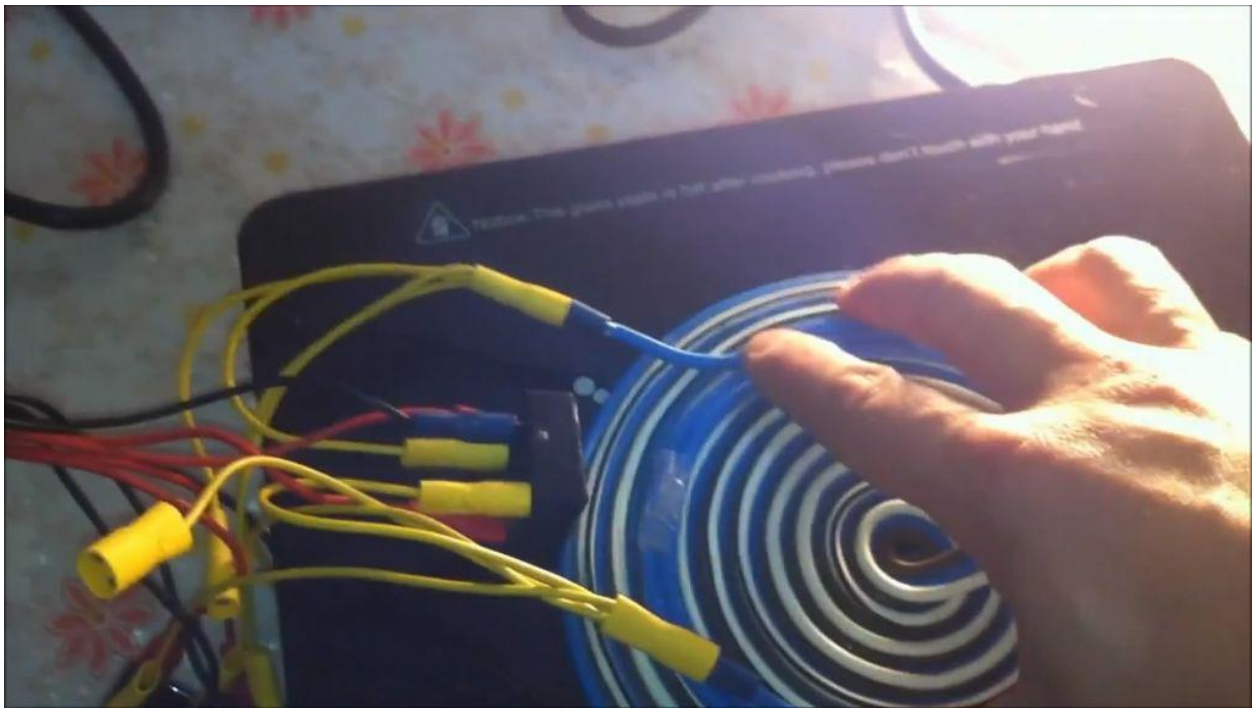

Wall socket
BLOCK
SCHEMATIC
Load
Meter
Power Extension
Meter
Power Extension
Grid Tie
Inverter


GRID TIE POWER
INVERTER
MODEL NO.:GP-350W


This is the coil to power the inverter




In my case the system starts without any magnetic sheet
2000



765.4 Watts of power in from the grid

875.6 watts used by the device

952 W – 799.5 W = 152.5 W

Here is the video of the "Romero UK" GEGENE tests in looped mode:

https://www.youtube.com/watch?v=H8_zj4cRXYk

Next TEST:

TEST #5 : New efficiency measurements with an oscilloscope and more power at the output

TEST #5: New Efficiency Measurements with a Digital Oscilloscope with More Power

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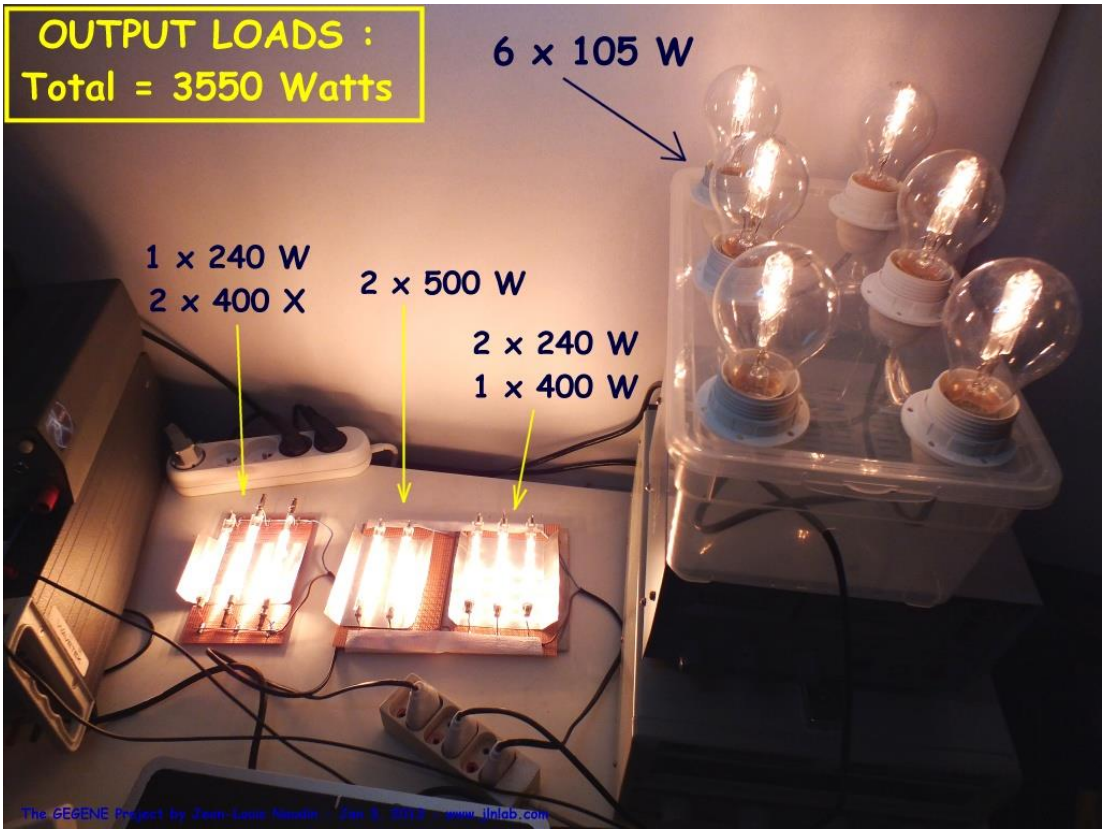
January 3, 2013 - TEST #5: Here is a new series of power I/O measurements with a digital oscilloscope; this series of measurements is following the previous TEST#2. The two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current i.e. the voltage across a 0.1 Ohm non inductive resistor Mundorf MR10 10W. Then the data are sent to a datasheet to compute true RMS values and the efficiency. The electrical power input of the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid.

In this new test, I have added more power at the OUTPUT by adding more halogen lamps, there are:

- 1 box of 6 halogen lamps of 105 W
- 2 sets of halogen which contains:
  - 1 set of halogen tubes: ((2 x 240 W) + (1 x 400 W)) + (2 x 500 W)

- 1 set of halogen tubes: (1 x 240 W) + (2 x 400 W)

The **TOTAL POWER** connected at the **OUTPUT** of the GEGENE is **3550 Watts.**

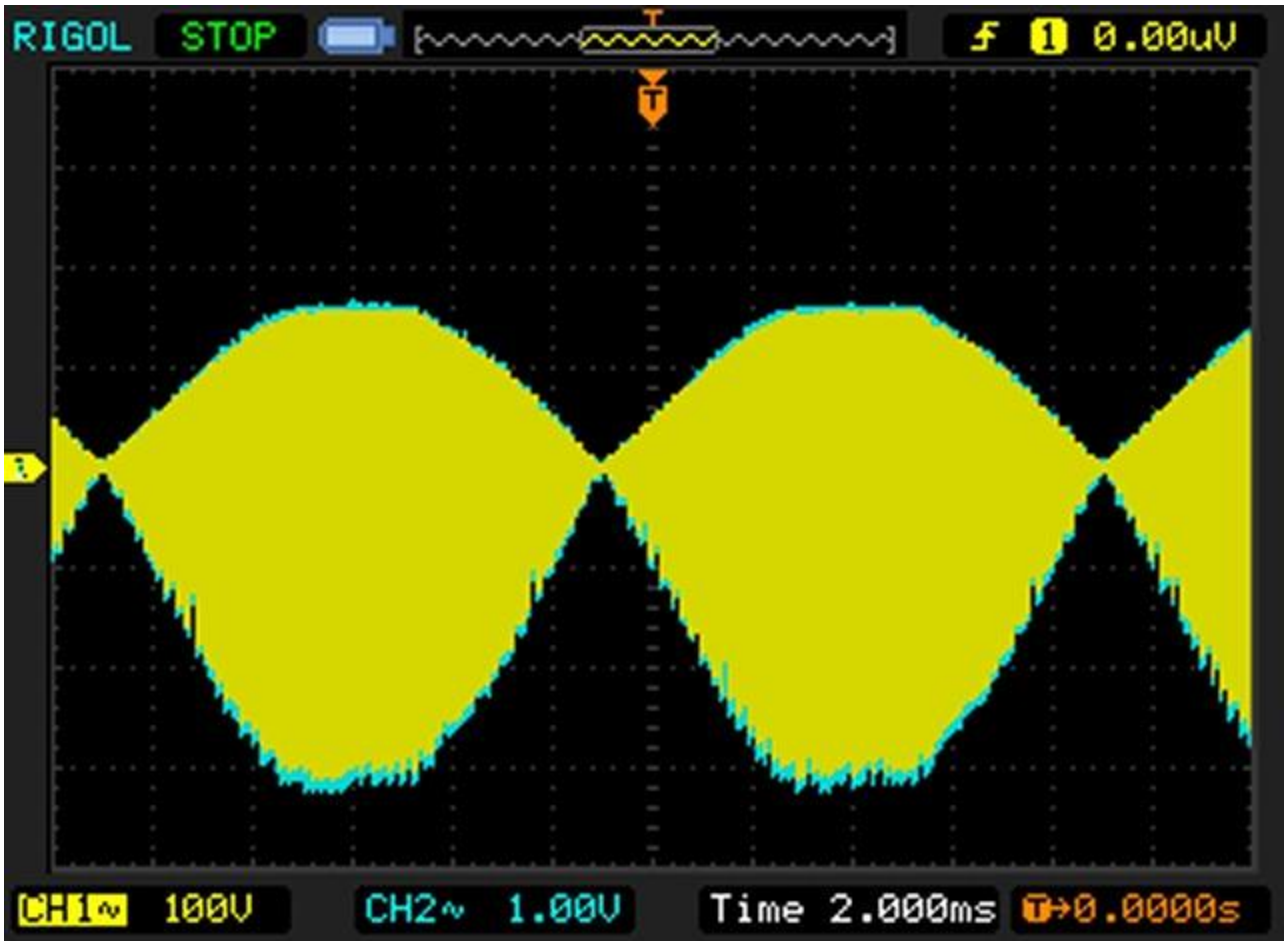


Below the setup of the TEST #5:

TEST #5 RESULTS:

Of course, the voltage, the current and the power are true RMS values.

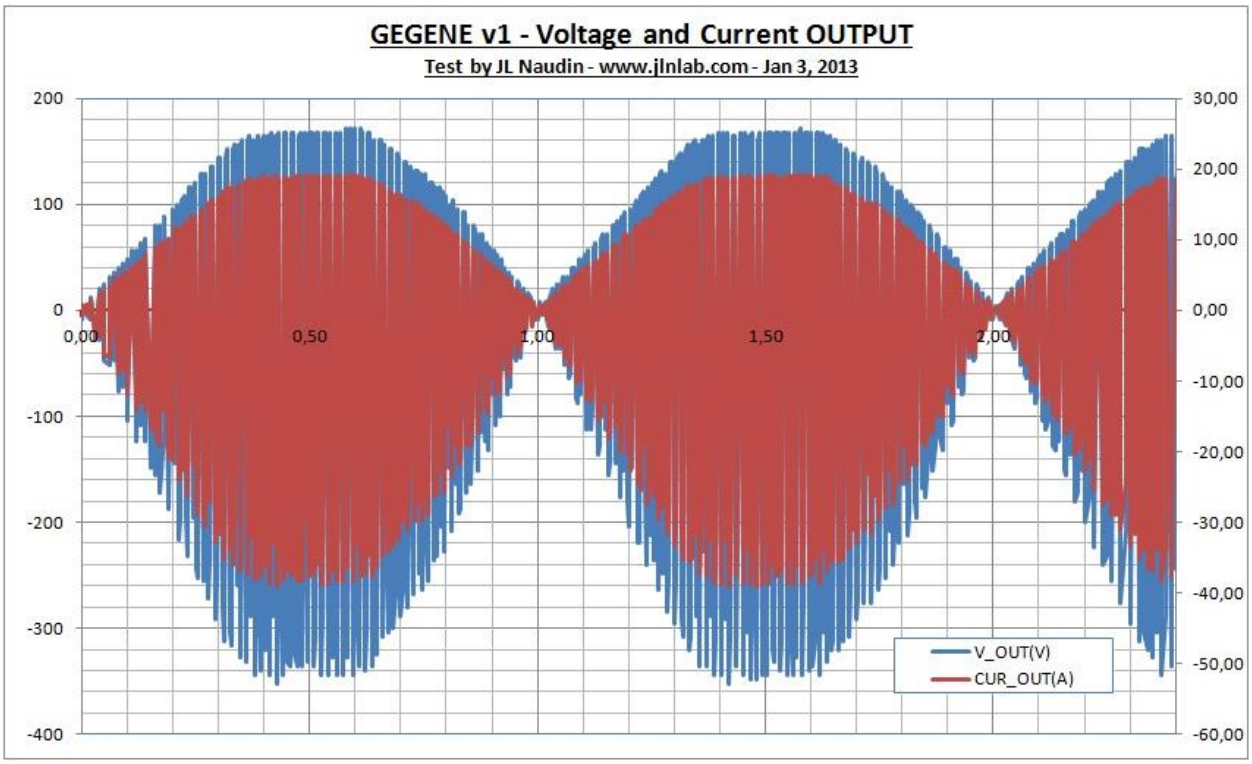
Unlike the previous TEST2, I have chosen a wider time scale so as to include the pulsation of the power.

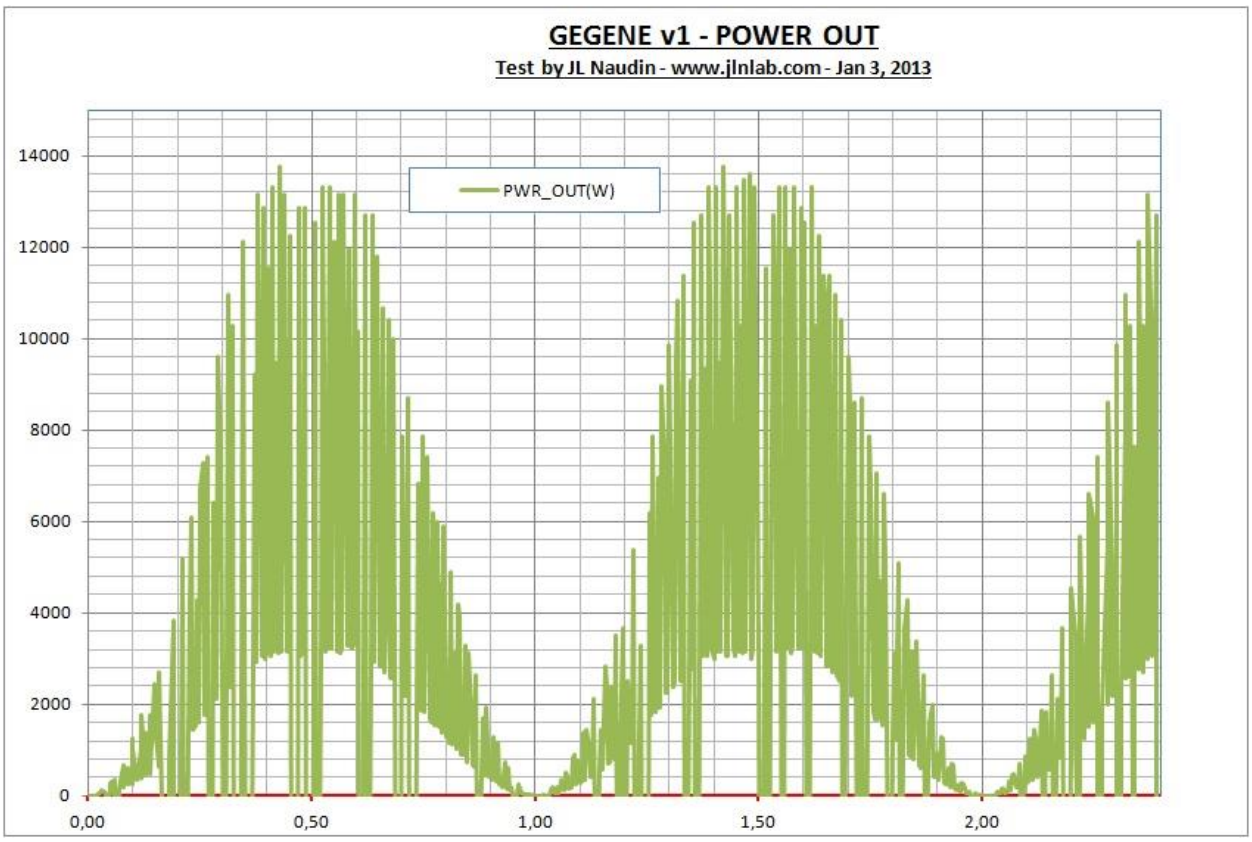


You may download the full data of the digital scope HERE.

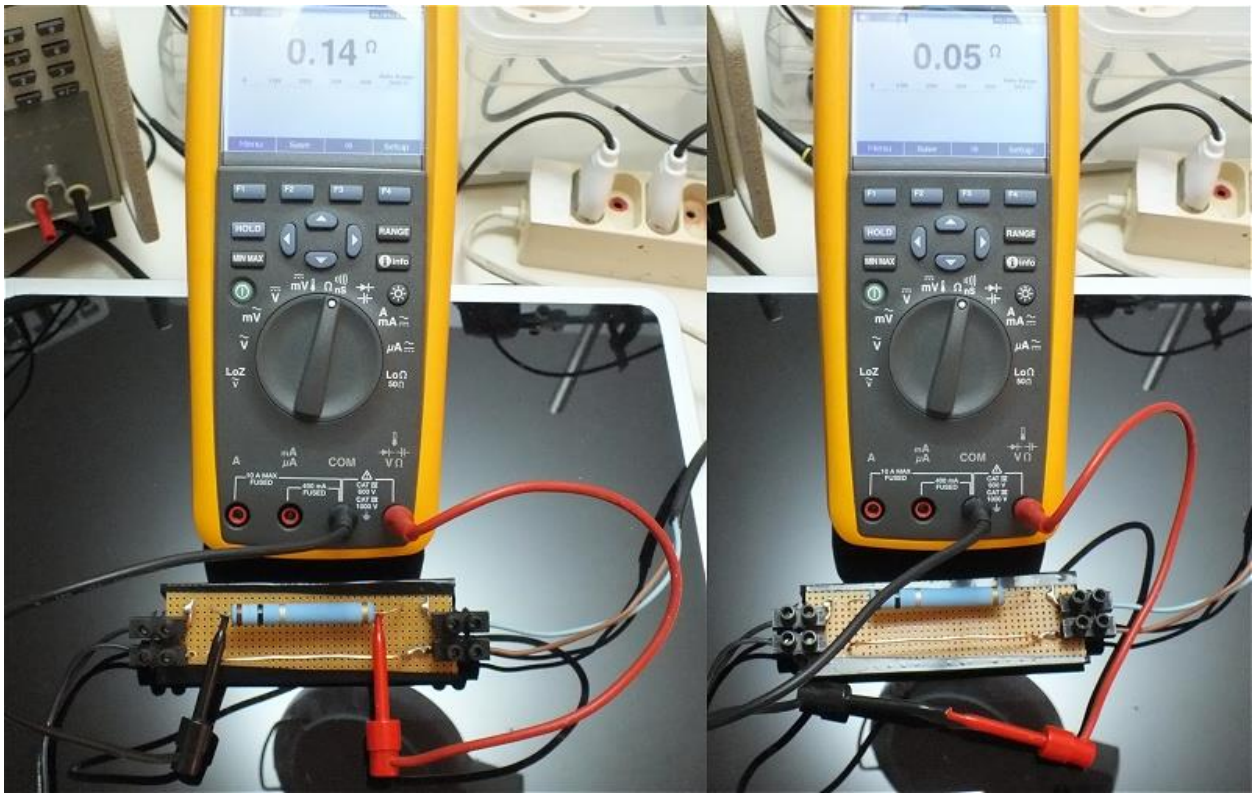
Here is a zoom on the voltage and the current; there is no inductive effect here.

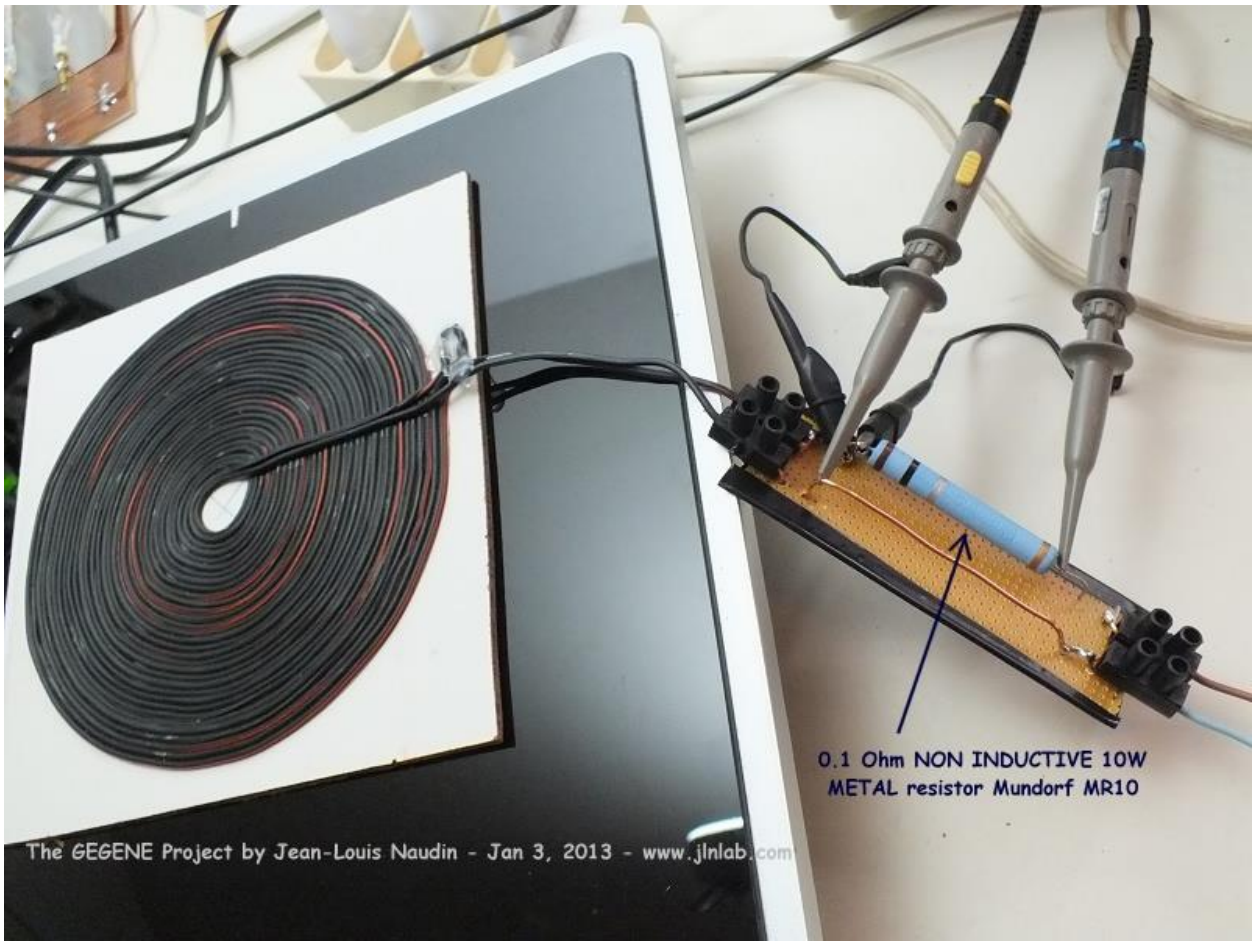

RIGOL
STOP
-12.0V
Math scale: 100V
CH1 100V
CH2 1.00V
Time 10.00us
0.0000s


GEGENE v1 - Voltage and Current OUTPUT
Test by JL Naudin - www.jlnlab.com - Jan 3, 2013
200
100
0
-100
-200
-300
-400
30,00
20,00
10,00
0,00
-10,00
-20,00
-30,00
-40,00
-50,00
-60,00
0,00
0,50
1,00
1,50
2,00
V_OUT(V)
CUR_OUT(A)

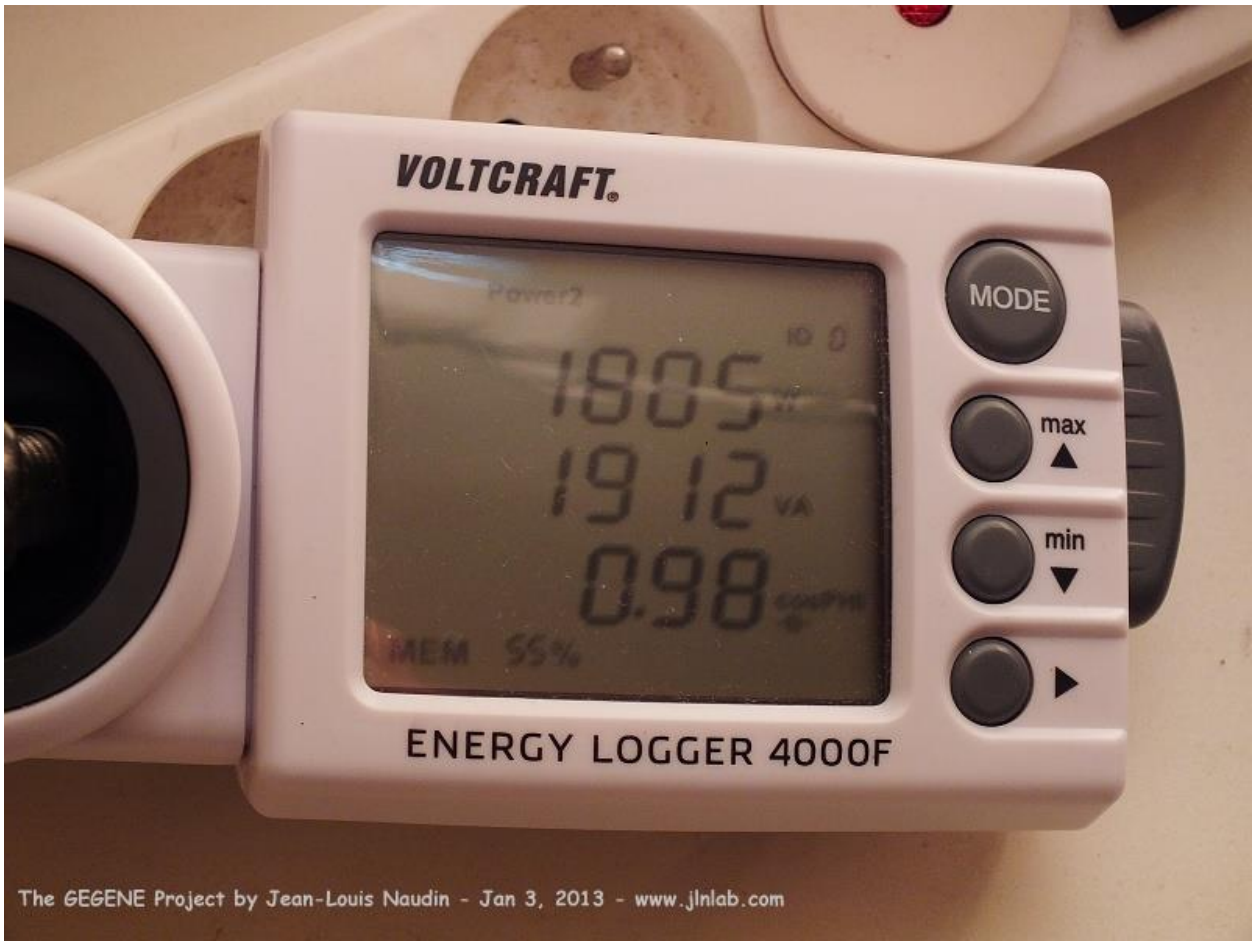

GEGENE v1 - POWER OUT
Test by JL Naudin - www.jlnlab.com - Jan 3, 2013
14000
12000
10000
8000
6000
4000
2000
0
0,00
0,50
1,00
1,50
2,00
PWR_OUT(W)

Here are the accurate measurements of the non-inductive resistor, a Mundorf MR10 of 0.1 ohm 10W. The true value is 0.09 Ohm.





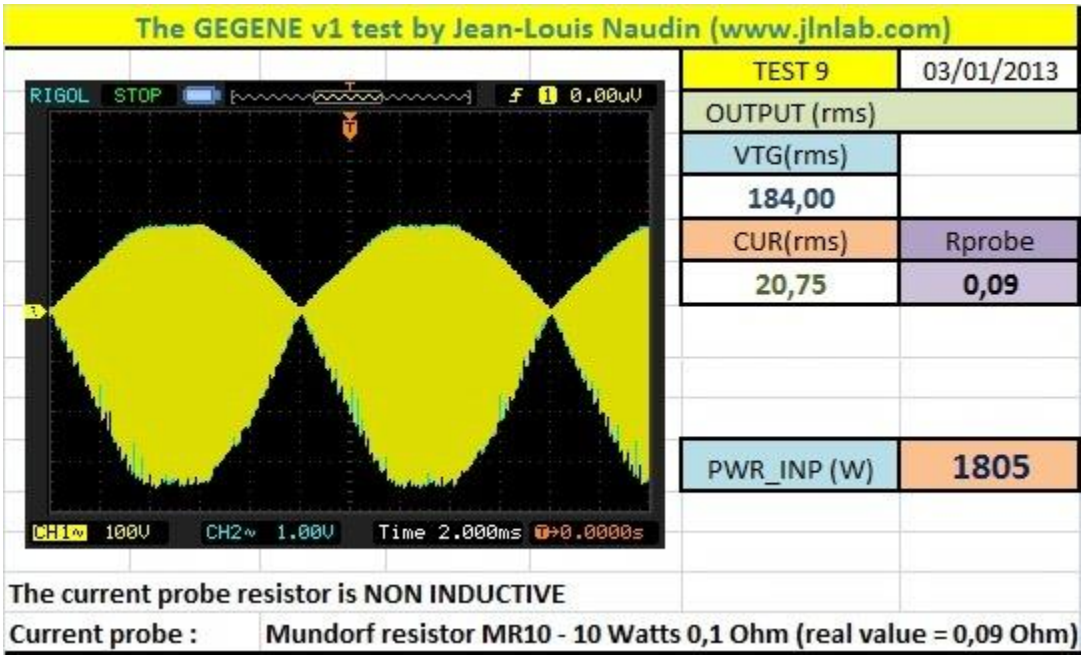
The electrical power for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid:


VOLTCRAFT
MODE
max
min
1805
1912
0.98
MEM 55%
ENERGY LOGGER 4000F
The GEGENE Project by Jean-Louis Naudin - Jan 3, 2013 - www.jlnlab.com


HEAT
2000
W

The Wattmeter measures 1805 Watts at the INPUT, this is in line with the 2000 Watts programmed on the induction cooker.

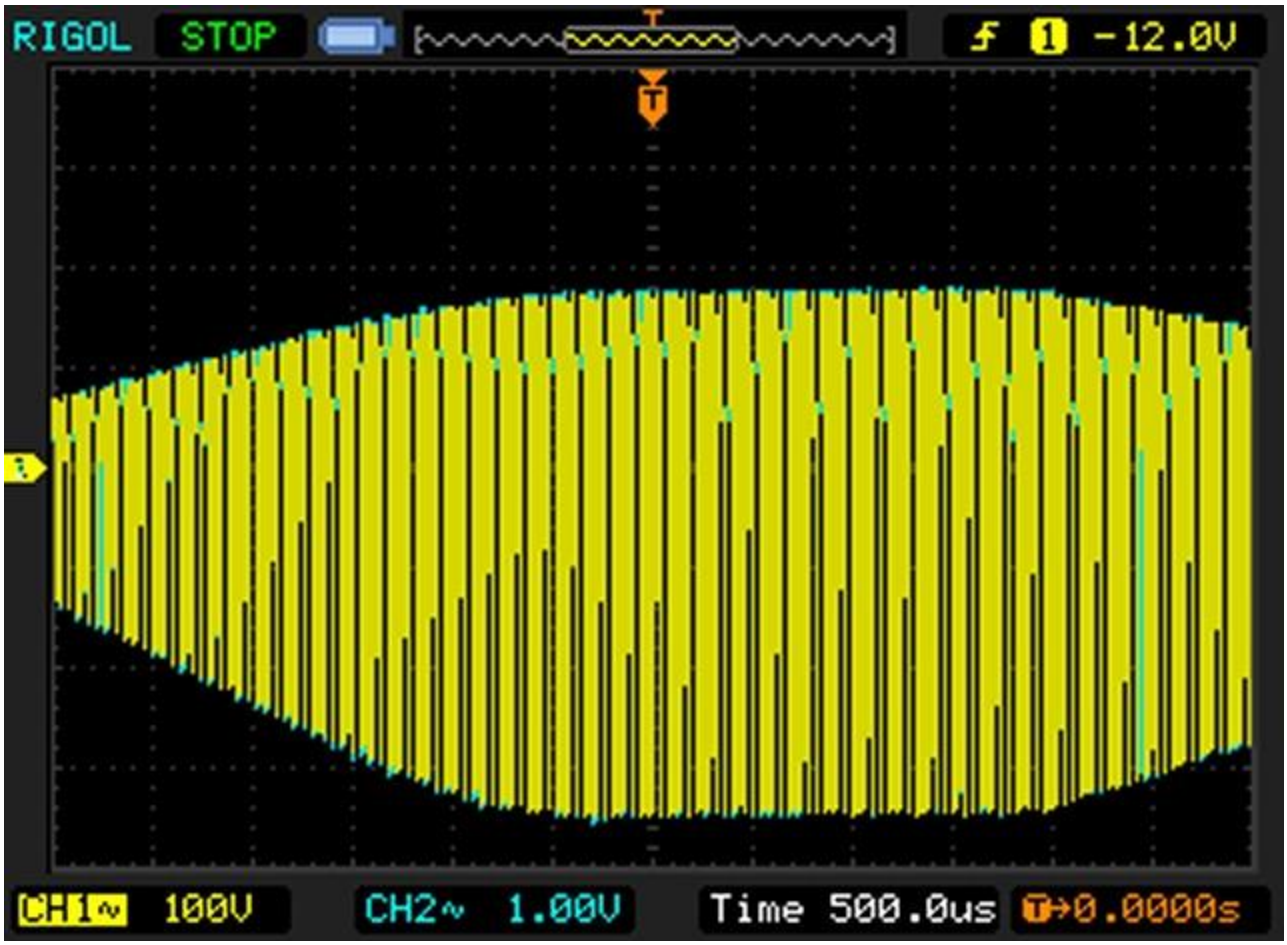
So, the true RMS voltage and the true RMS current computed with the data measured with the digital oscilloscope are:

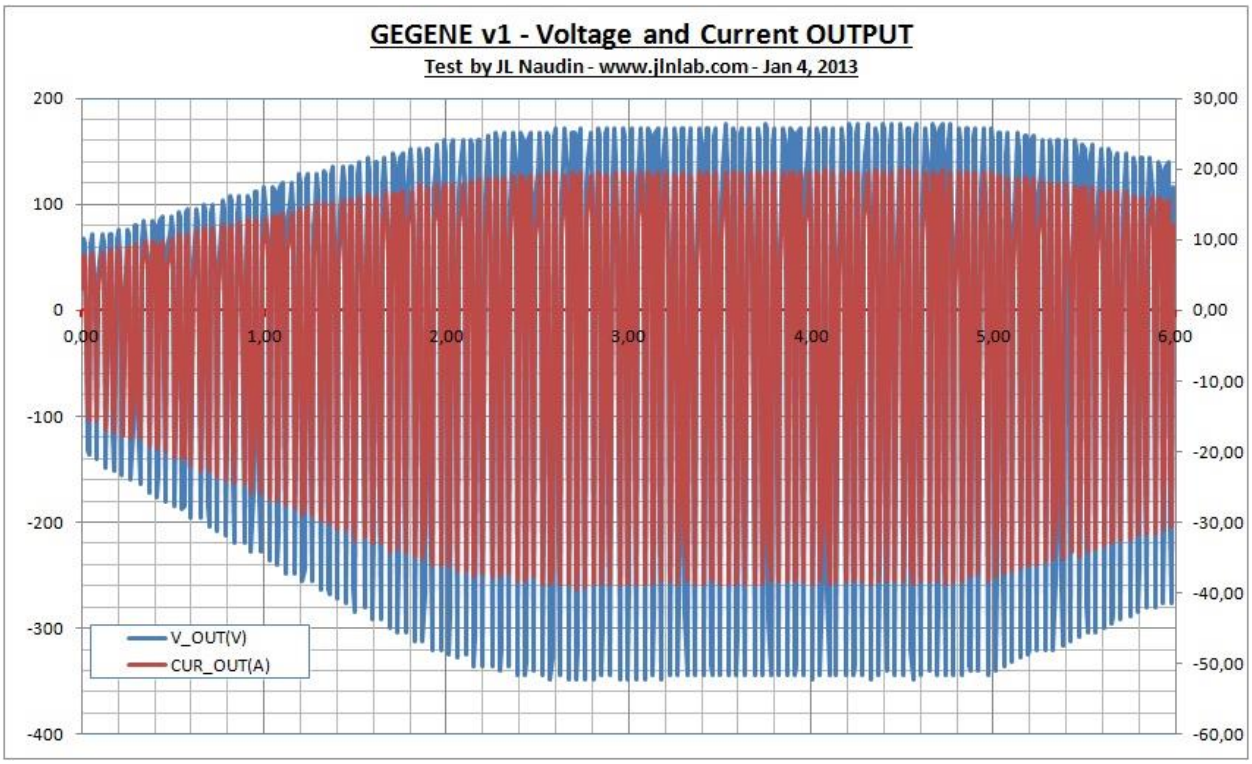


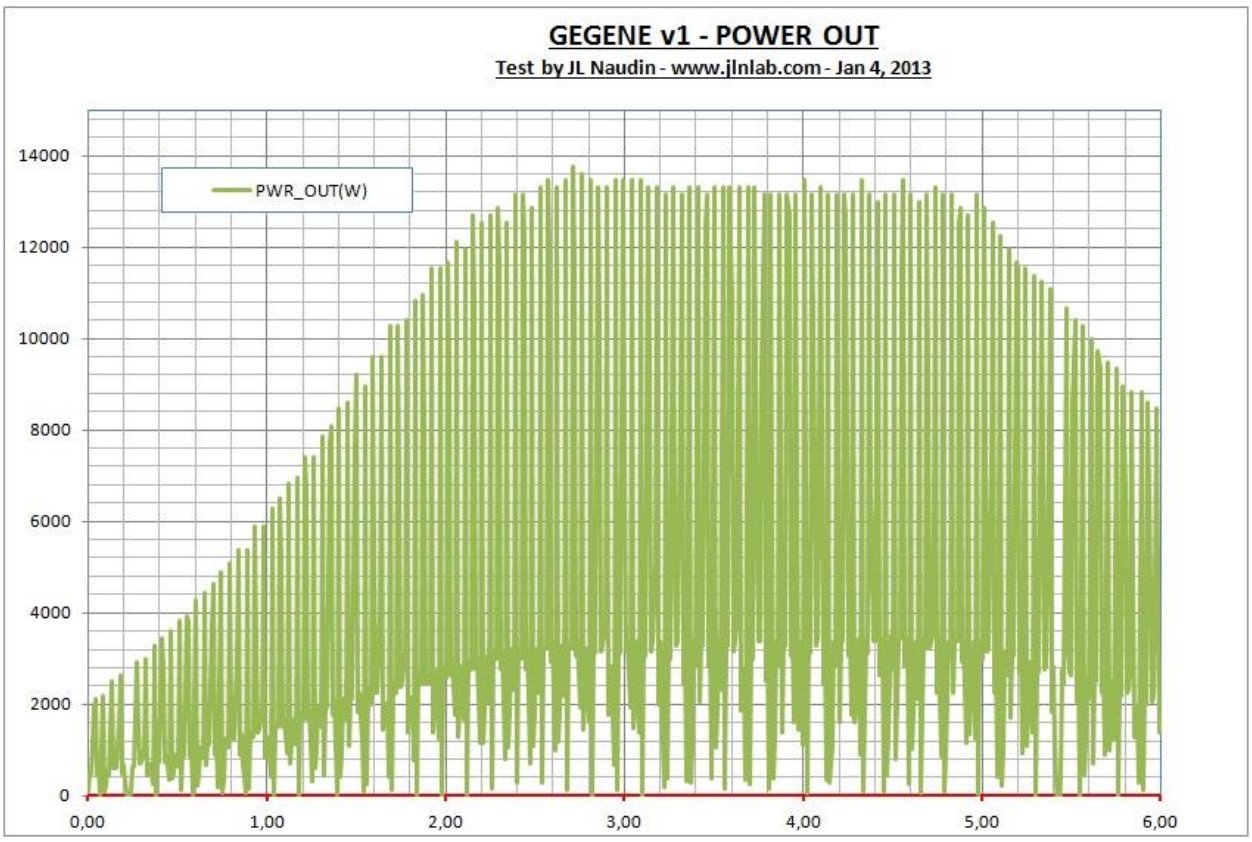
Here is a video of the tests of the GEGENE at full power:

http://www.youtube.com/embed/Q5EoCKPkGT0

New measurements (4th of January) done with the digital scope with a time base of 500 µs/div and 100 MSa (full scope data here).


RIGOL
STOP
-12.0V
CH1
100V
CH2
1.00V
Time 500.0us
0.0000s


GEGENE v1 - Voltage and Current OUTPUT
Test by JL Naudin - www.jlnlab.com - Jan 4, 2013
200
100
0
-100
-200
-300
-400
30,00
20,00
10,00
0,00
-10,00
-20,00
-30,00
-40,00
-50,00
-60,00
0,00
1,00
2,00
3,00
4,00
5,00
6,00
V_OUT(V)
CUR_OUT(A)


GEGENE v1 - POWER OUT
Test by JL Naudin - www.jlnlab.com - Jan 4, 2013
14000
12000
10000
8000
6000
4000
2000
0
0,00
1,00
2,00
3,00
4,00
5,00
6,00
PWR_OUT(W)

The electrical input power of the induction cooker measured with the Wattmeter Energy Logger 4000F on the power grid is 1900 Watts

Stay tuned.

TEST #6: A Very Interesting Test Done by WOOPY About The Power Extraction

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January 4, 2013 - TEST #6: Here is a video done by WOOPY about the power tapping with a small model of induction cooker limited to 800 W and loaded at the bifilar Tesla coil with 2800 Watts of halogen lamps. Congratulations to WOOPY for his very interesting observations about these tests of the GEGENE, and thanks to him for the sharing of this experiment with us.

Here is the video of the GEGENE tests done by WOOPY.

http://www.youtube.com/embed/LbAhUwHvJCE

Here is the video of the first and earlier test of the GEGENE done by WOOPY.

http://www.youtube.com/embed/7QC-NrtHJjw

NEXT TEST

TEST #7 : Test of the model v1.1 with a new bifilar flat Tesla coil

TEST #7: Tests of the Model v1.1 with a New Bifilar Flat Tesla Coil

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January 5, 2013 - TEST #7: Here is a new version v1.1 of the GEGENE with a new flat bifilar Tesla coil.

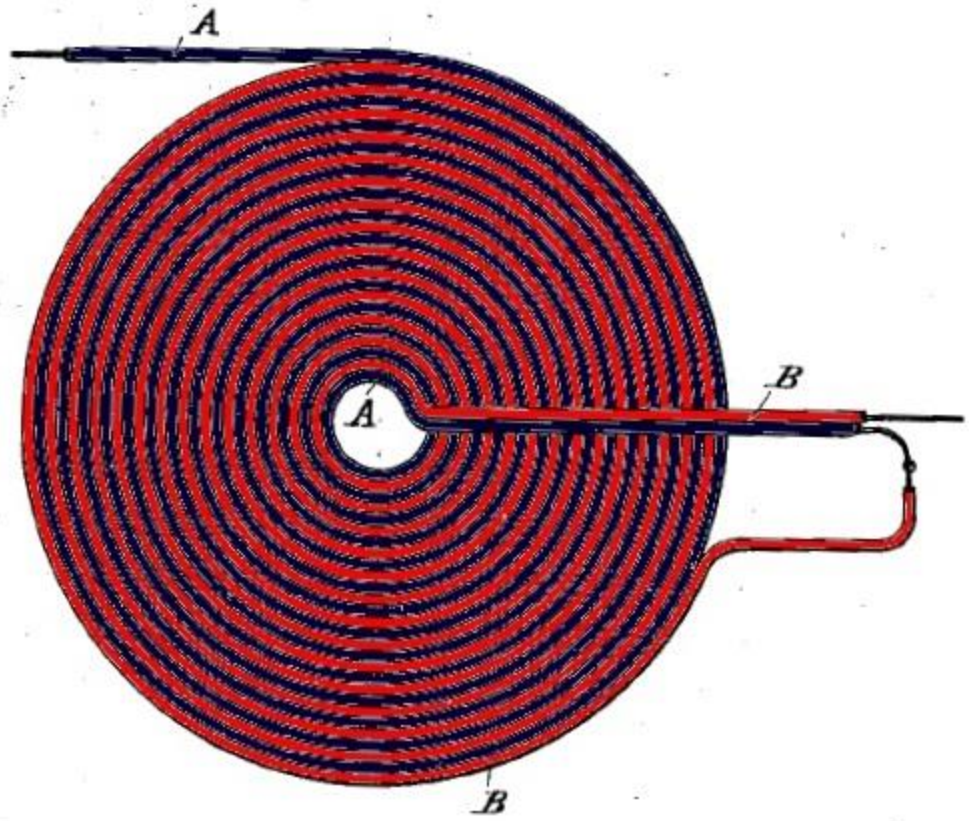
The power I/O measurements have been done with a common digital oscilloscope; the measurements have been also checked on an ungrounded oscilloscope, Fluke123, powered by its own internal batteries. The two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current i.e. the voltage across a 0.1 Ohm non inductive resistor, a Mundorf MR10 10W. Then the data is sent to a datasheet to compute true RMS values and the efficiency. The electrical power input of the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid.

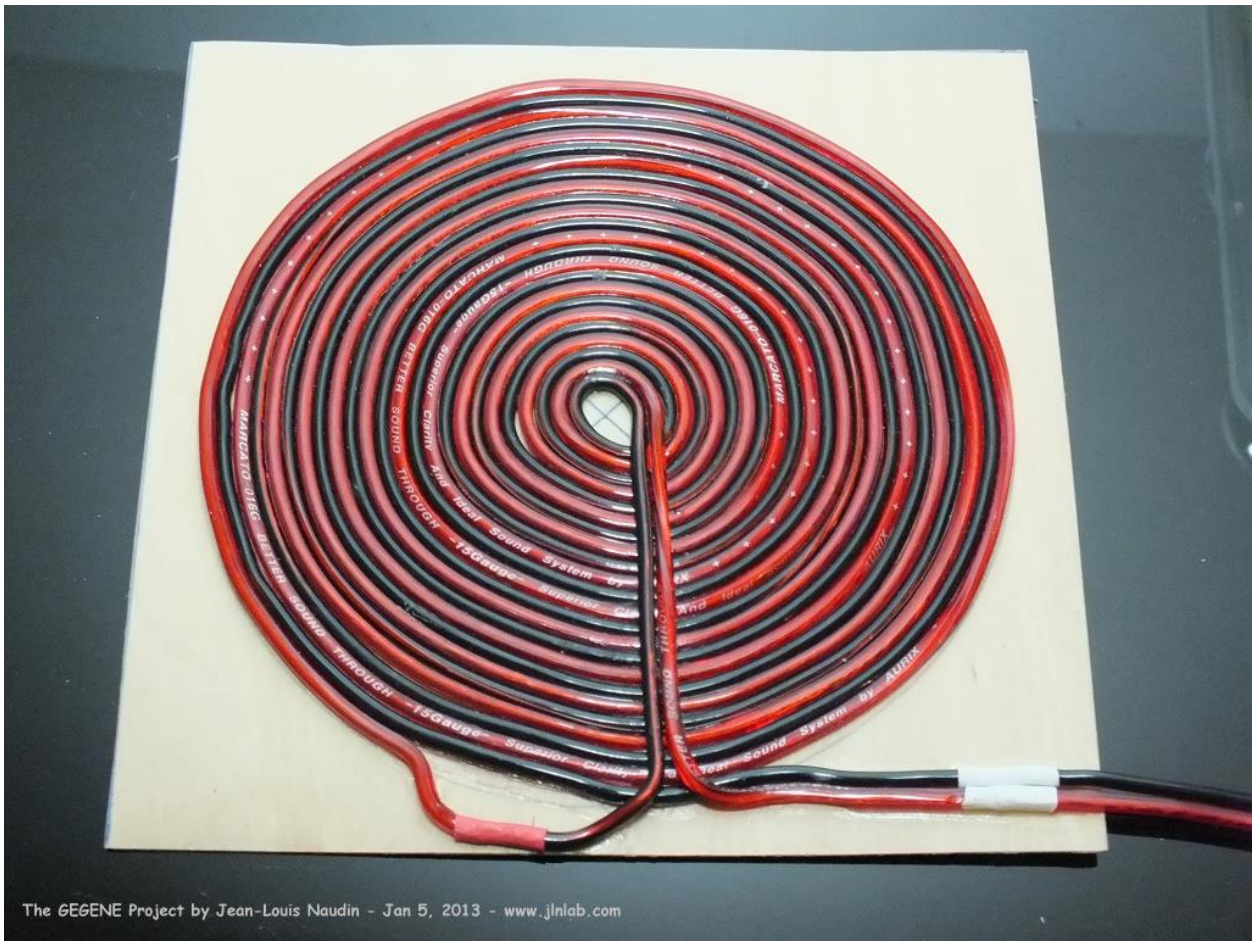
In this test, I have used the same setup of halogen lamps as for the TEST#5, there are:

- 1 box of 6 halogen lamps of 105 W
- 2 sets of halogen lamps which contains:
    - 1 set of halogen tubes : ((2 x 240 W) + (1 x 400 W)) + (2 x 500 W)
    - 1 set of halogen tubes : (1 x 240 W) + (2 x 400 W)

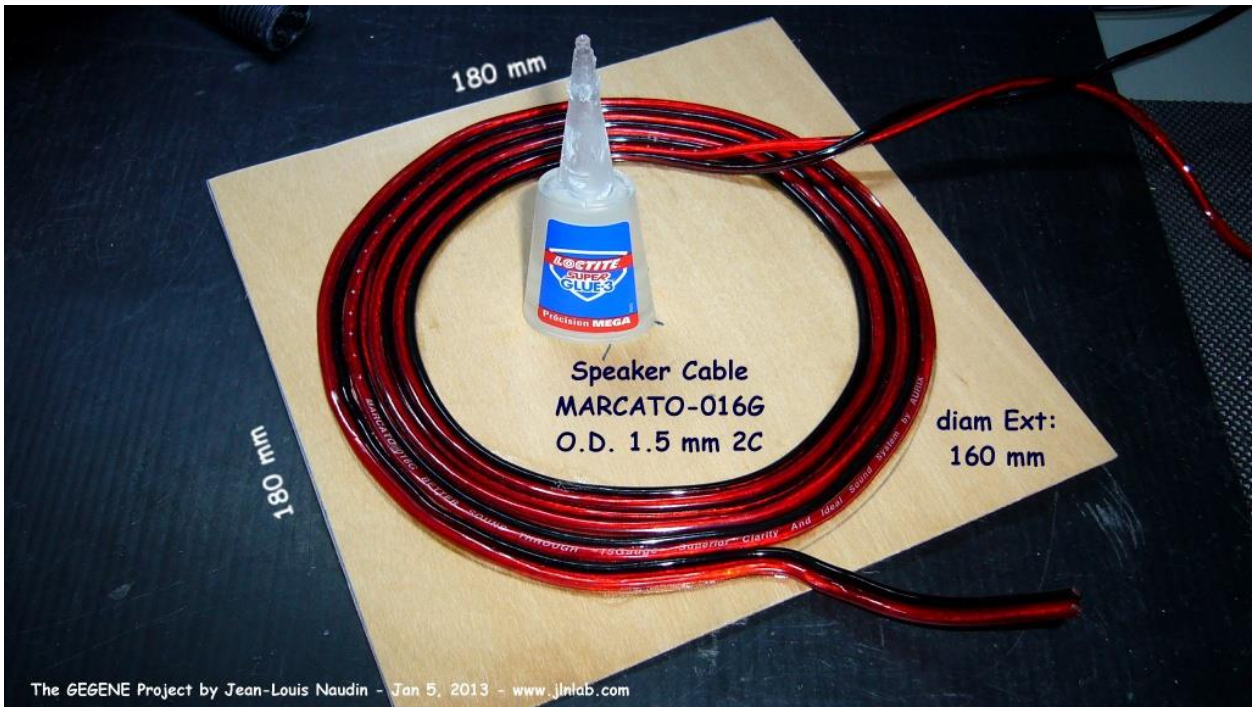
The **TOTAL POWER** connected at the **OUTPUT** of the GEGENE is **3550 Watts**

Here are the full construction details of my new flat bifilar Tesla coil v1.1, it is wound exactly as the flat bifilar Tesla coil described in his patent N° 512,340 from 1894.


A
A
B
B

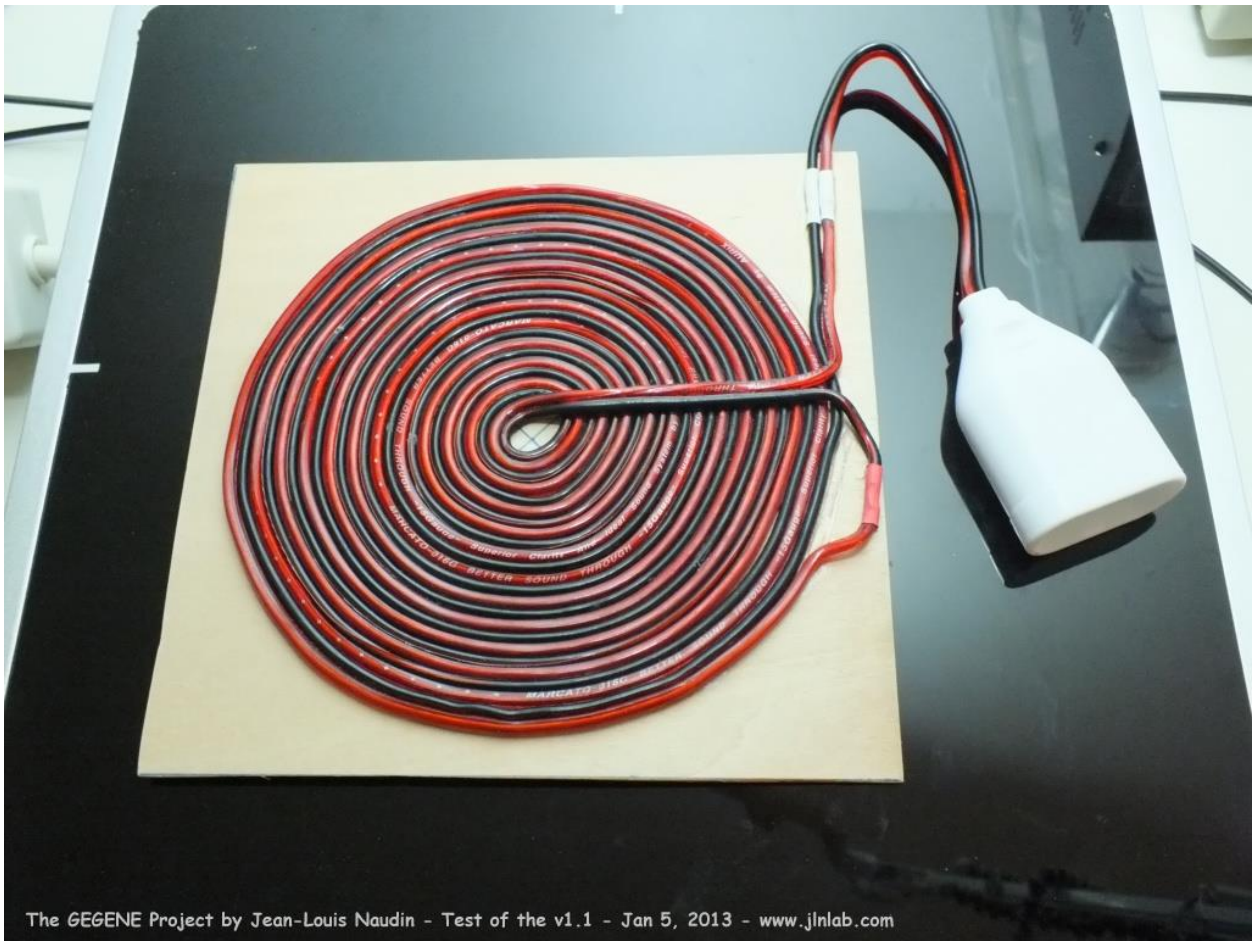


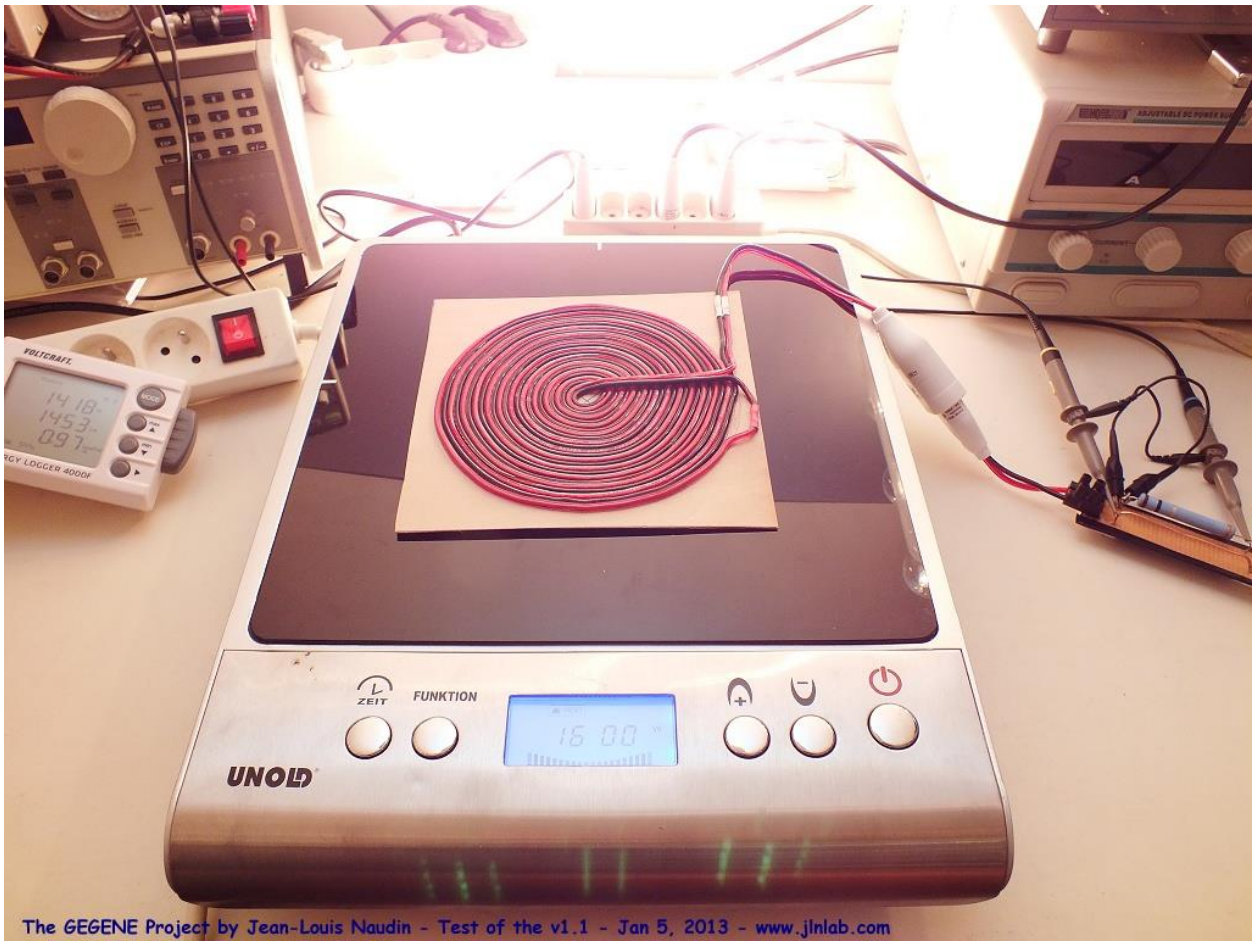
Below the construction details:



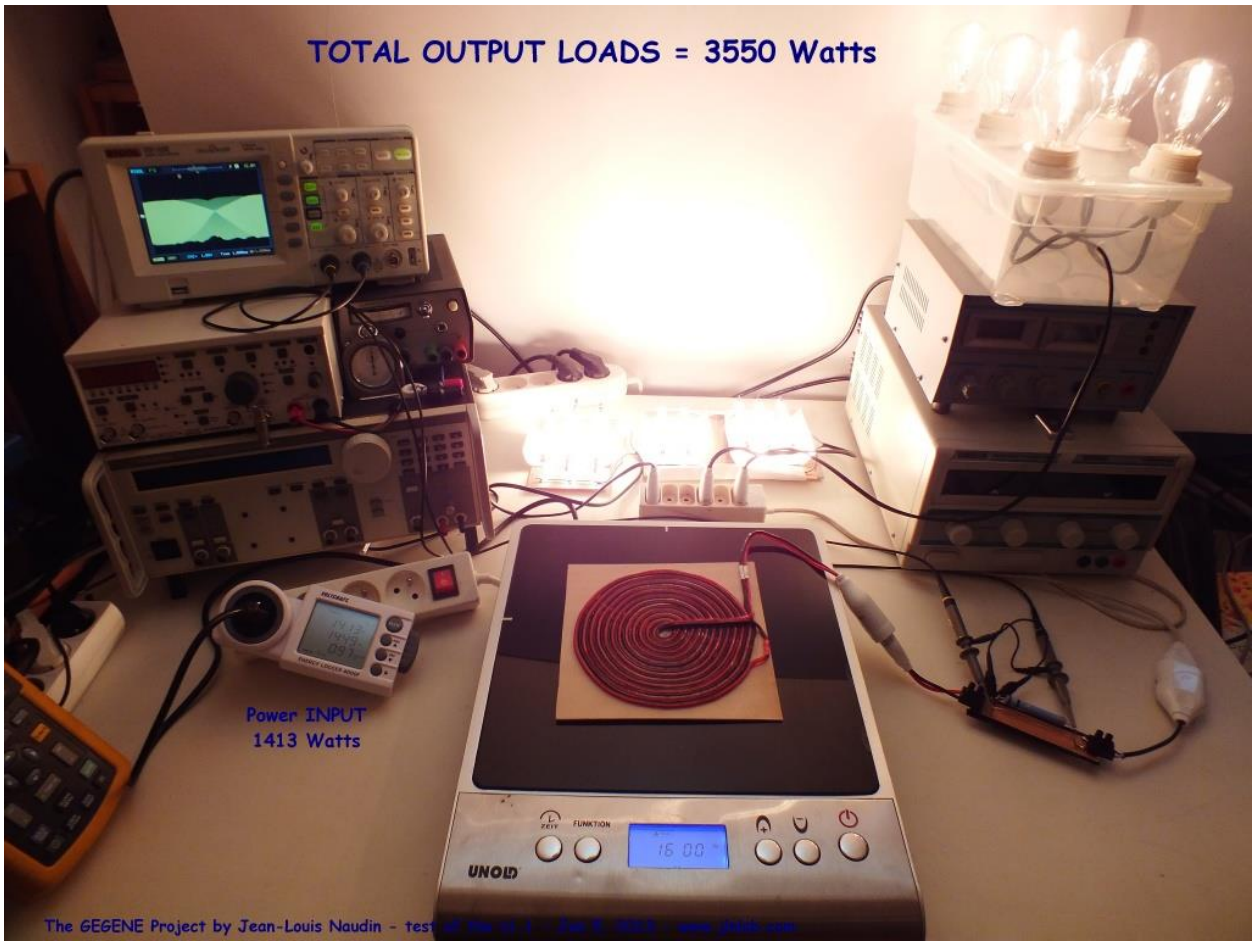
The coil is assembled on a plywood board of 10/10 mm thick and 180 x 180mm wide. The dual cable is fixed with cyanoacrylate glue.

The model v1.1 is ready for the tests:


The GEGENE Project by Jean-Louis Naudin - Test of the v1.1 - Jan 5, 2013 - www.jlnlab.com

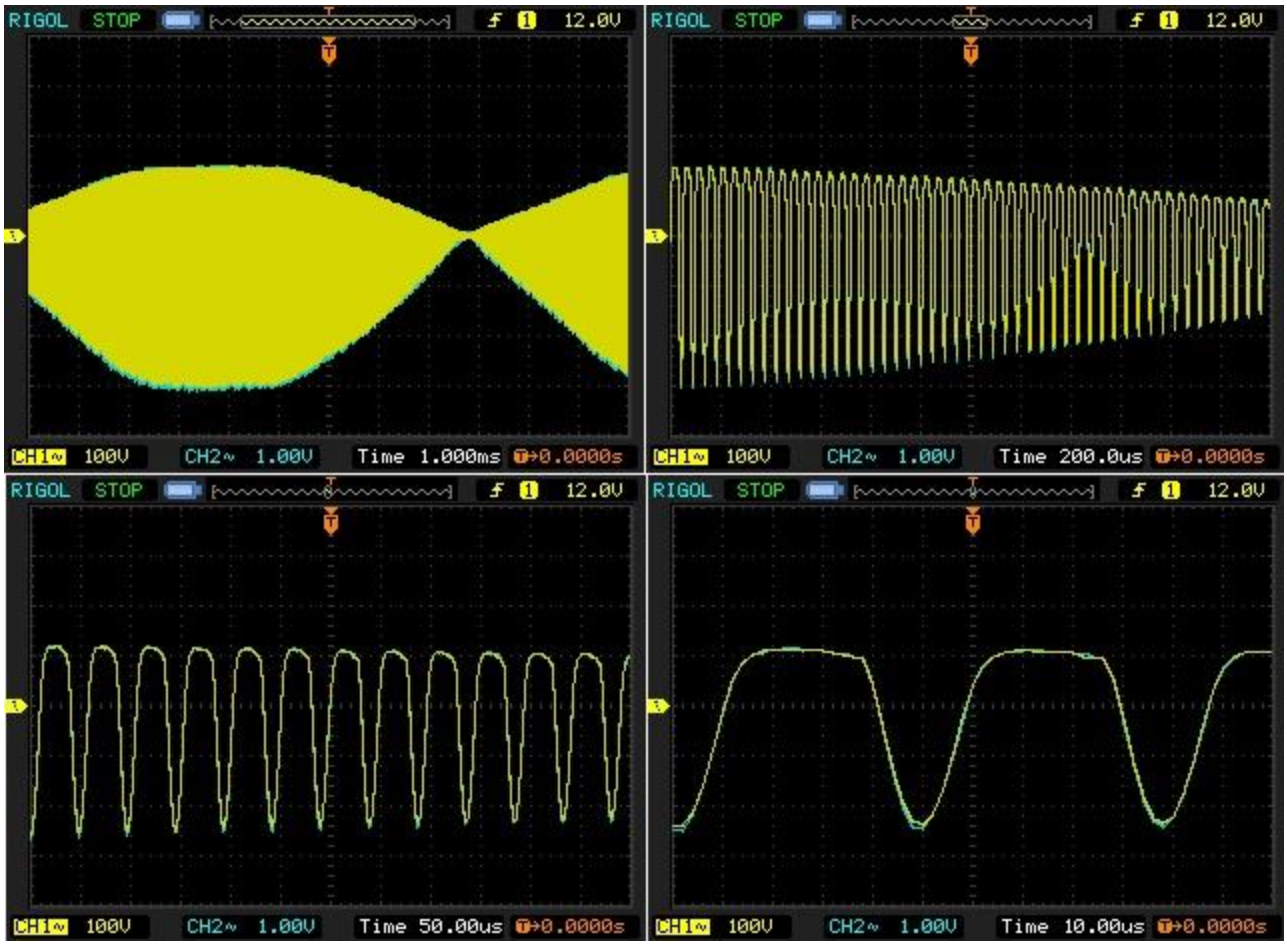


Here the setup of the TEST #7:



TEST #7 RESULT:

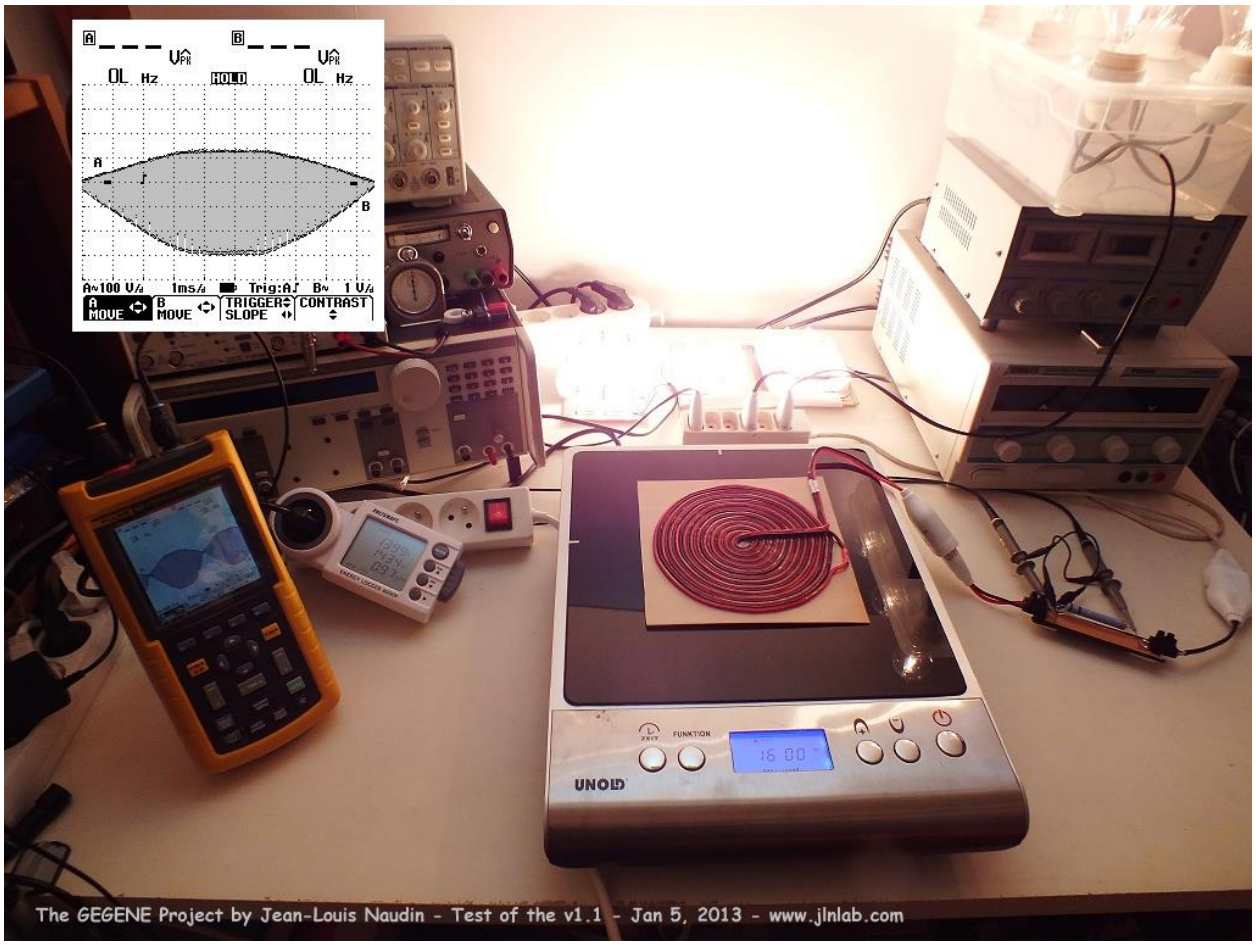
Here are the measurements done with a digital oscilloscope:

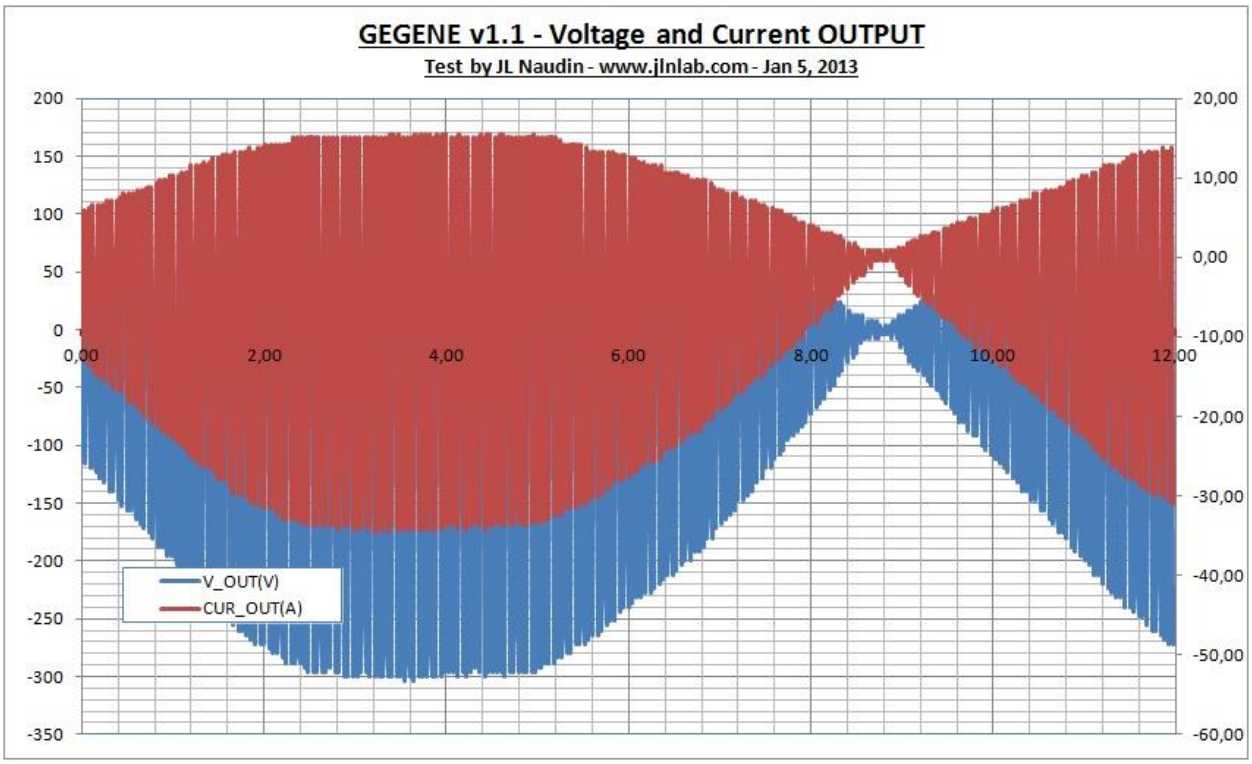


A zoom on the voltage and the current shows clearly that there is no inductive effect here.

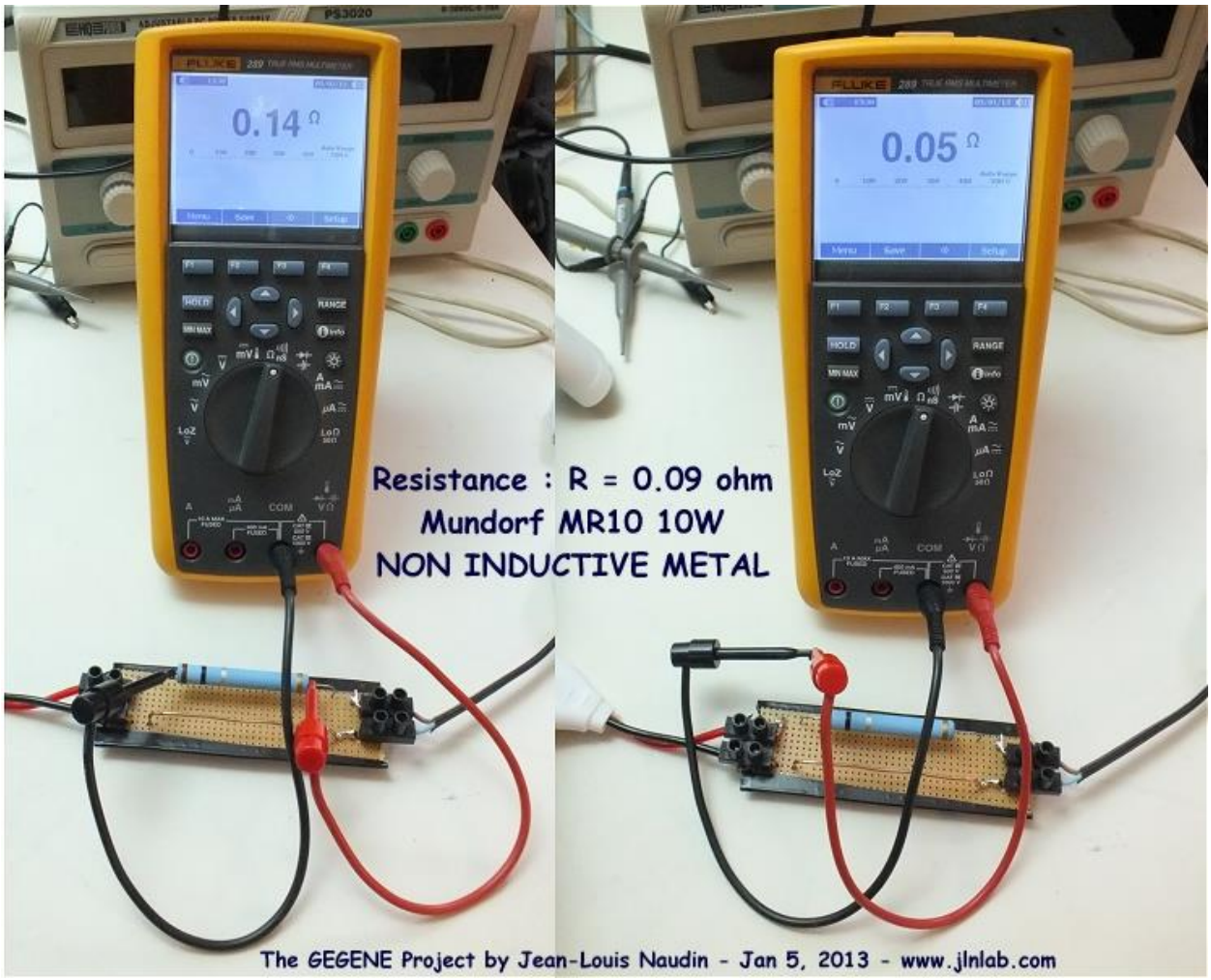
The voltage and current measurements have also been checked with an "ungrounded" oscilloscope Fluke123 and powered with its own internal batteries.

The measured values are perfectly similar.


A
B
OL Hz
HOLD
OL Hz
A
B
A 100 V/d
1ms/d
Trig:A/
B
1 V/d
A MOVE
B MOVE
TRIGGER SLOPE
CONTRAST
UNOLD
FUNKTION
The GEGENE Project by Jean-Louis Naudin - Test of the v1.1 - Jan 5, 2013 - www.jlnlab.com



Here the accurate measurements of the non inductive resistor Mundorf MR10 of 0.1 ohm 10W. The true value is 0.09 Ohm.



The value of the non inductive metal resistance used as the current probe is still the same since the previous TEST#2 and TEST#5.

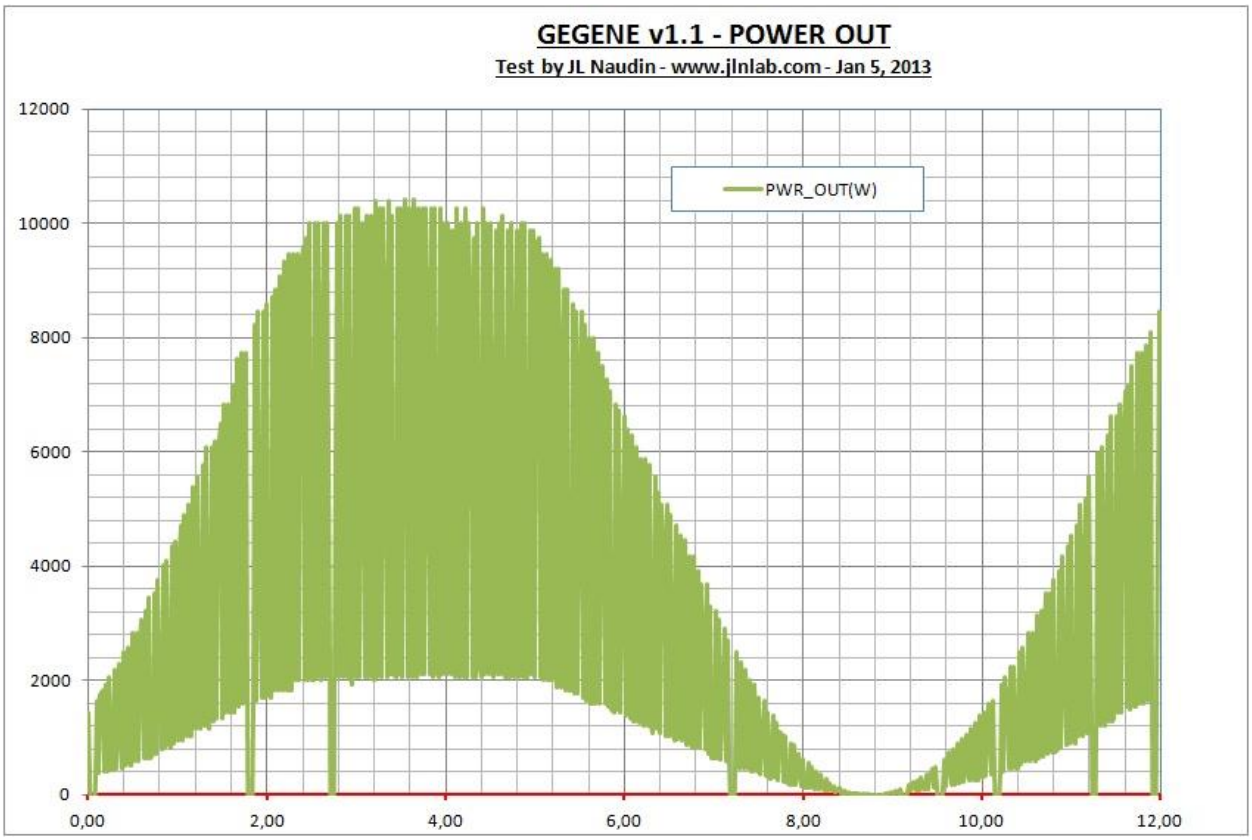
The electrical power for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid:


HEAT
16 00
W


VOLTCRAFT
Power2
1431 W
1468 VA
0.97
MEM 54%
MODE
max
min
ENERGY LOGGER 4000F

The Wattmeter measures 1431 Watts at the INPUT, this is in line with the 1600 Watts programmed on the induction cooker.

Below the curve of the power output of the halogen lamps computed with the data recorded with the digital oscilloscope.



Here is a video of the tests of the GEGENE v1.1 in action

http://www.youtube.com/embed/Q5EoCKPkGT0

NEXT TEST:

TEST #8: A very interesting idea about the GEGENE shared by WOOPY

TEST #8: A Very Interesting Idea Done by WOOPY about the Power Extraction

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7 January 2013 - TEST #8: Here is an interesting idea shared with you by WOOPY about the Tesla bifilar coil used for the power extraction at the GEGENE Output.

Congratulations to WOOPY for his very interesting observations about these tests of the GEGENE and thanks to him for the sharing of this experiment with us.

Here is the WOOPY video

http://www.youtube.com/embed/SSqHwMabmmw

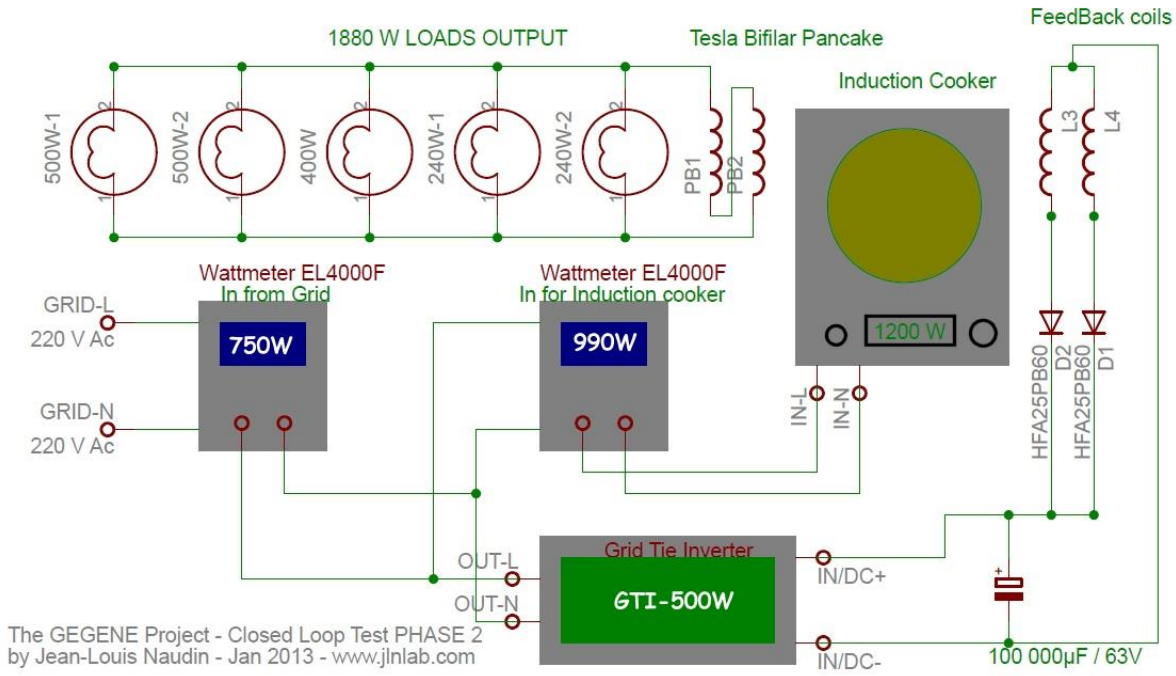
NEXT TEST:

TEST #9 : CLOSED-LOOP (Phase 2) of the GEGENE via a Grid Tie Power Inverter (GTI)

TEST #9: CLOSED-LOOP (Phase 2) of the GEGENE via a Grid Tie Power Inverter (GTI)

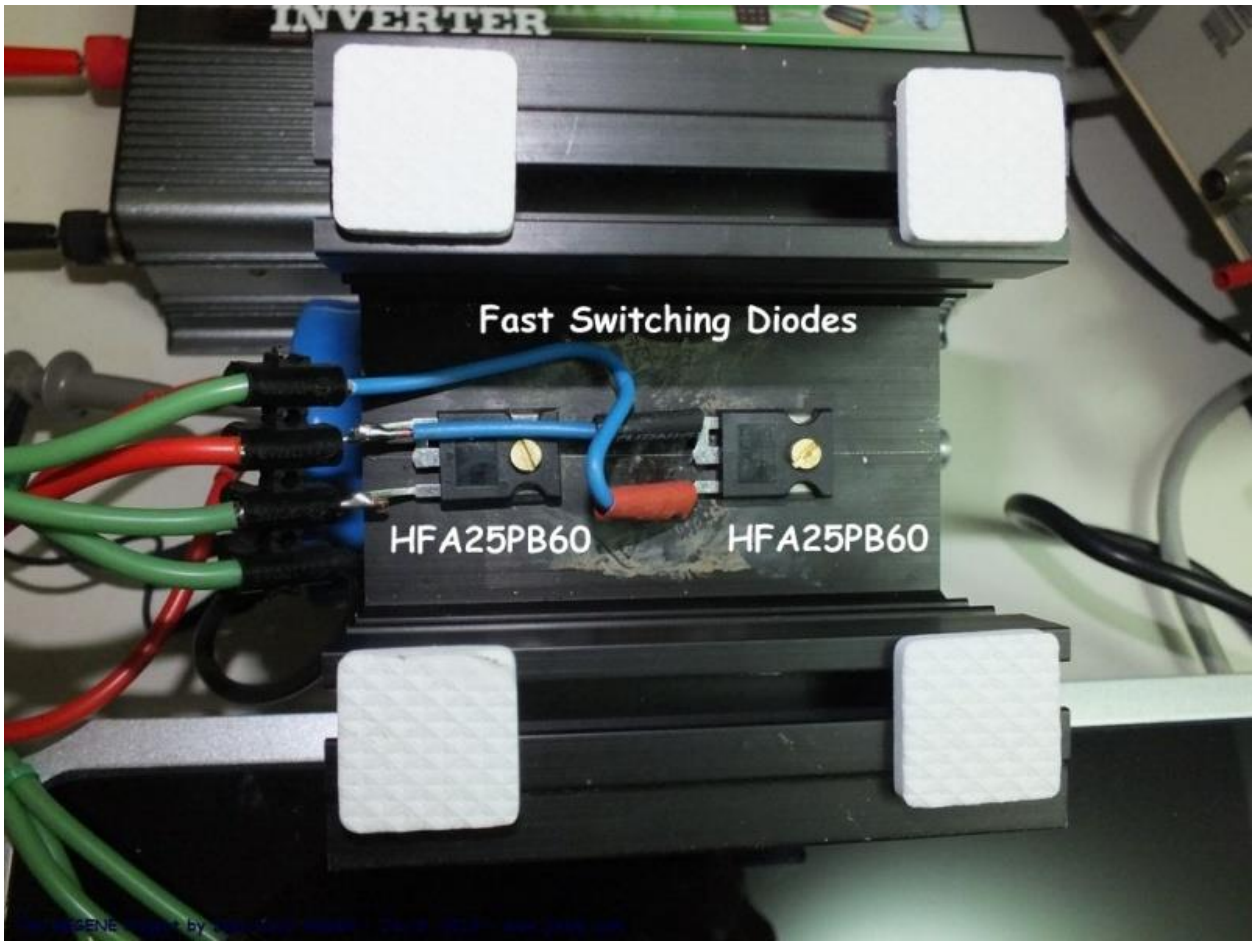
January 8, 2013 - TEST #9: Here is a test of the GEGENE v1.1 in a closed loop as shown by "Romero UK" in the TEST#4. The excess of power is re-injected at the input via a Grid Tie Inverter (GTI). In this phase 2, the GTI and the GEGENE need to be connected to the power grid because the 50 Hz (60 Hz for the US countries) is required for its working. The setup used in this test is not sufficient to get a full autonomous and Off-The-Grid system (the GTI that I have used is limited to 500 W and the feed-back coil is under sized). A full Off-The-Grid and closed loop system will have to use a pure sine wave inverter able to give 2500 W of power (battery powered) with a feed-back coil more powerful. It will have to be electronically regulated and stabilized to prevent some eventual power divergence.

Below is the schematic diagram of the closed loop system tested:



The dual feedback coil (2x3 turns of 1.5 mm^2 with outer diameter of 160 mm) is connected to two ultra fast recovery diodes HFA25PB60 which provide a full wave rectification at 25 KHz. A 100,000 µF/63 V condenser is used to get a smooth DC signal for the input of the GTI (Grid Tie Inverter).

Below are the 2 ultra fast recovery diodes used for the full wave rectification process.


INVERTER
Fast Switching Diodes
HFA25PB60
HFA25PB60

International
IOR Rectifier

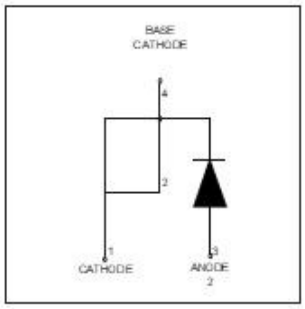
HFA25PB60

HEXFRED™

Ultrafast, Soft Recovery Diode

Features
- Ultrafast Recovery
- Ultrasoft Recovery
- Very Low I_{RRM}
- Very Low Q_{rr}
- Specified at Operating Conditions

Benefits
- Reduced RFI and EMI
- Reduced Power Loss in Diode and Switching Transistor
- Higher Frequency Operation
- Reduced Snubbing
- Reduced Parts Count



V_R = 600V
V_F(typ.)* = 1.3V
$I_{F(AV)}$ = 25A
Q_{rr} (typ.)= 112nC
I_{RRM} = 10A
t_{rr}(typ.) = 23ns
$di_{(rec)M}/dt$ (typ.) = 250A/µs

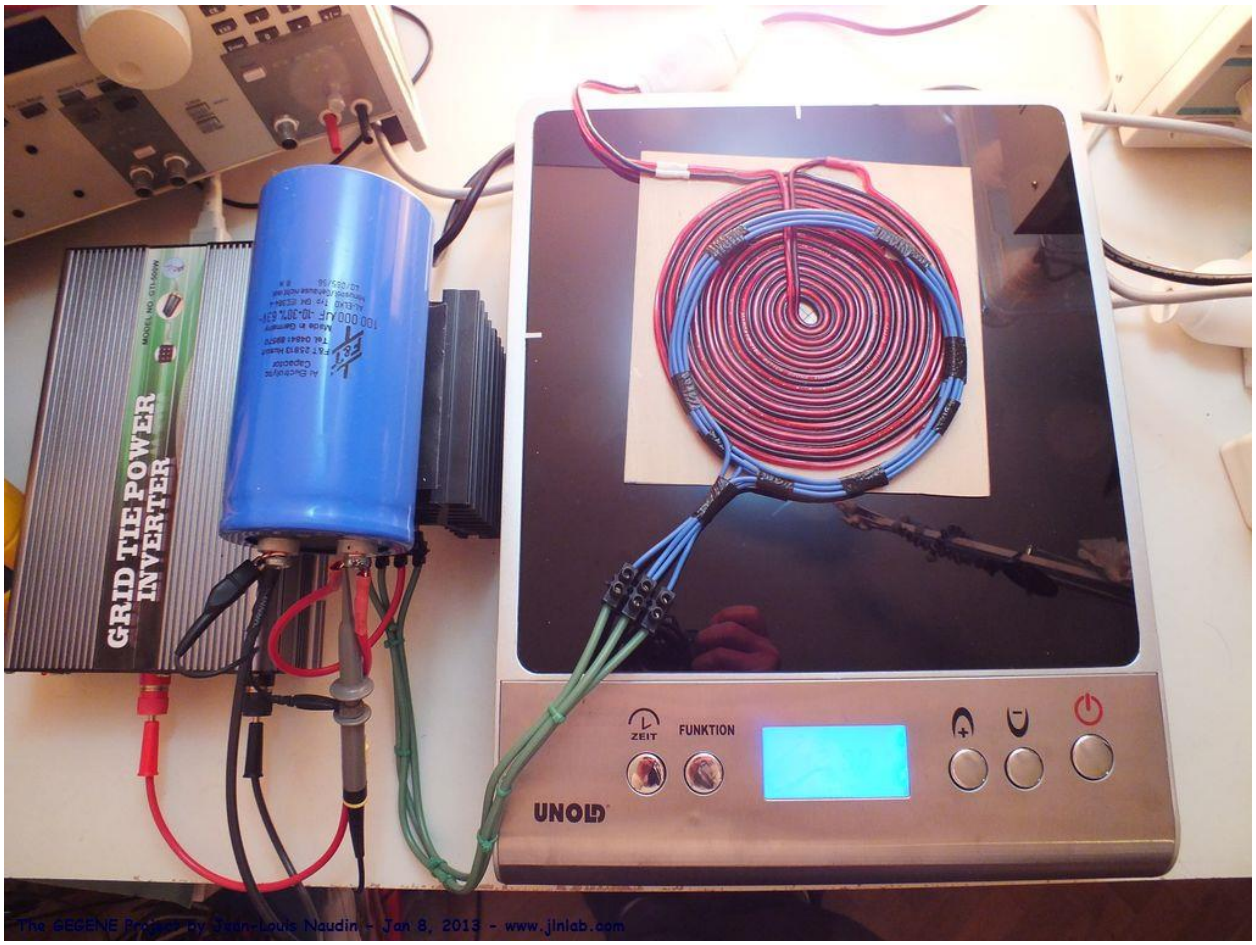
TO-247AC (Modified)

The full datasheet of the diodes can be downloaded HERE

It is required to use fast recovery diodes or a fast rectifier bridge due to the working frequency of about 25 KHz. A common bridge used for 50/60 Hz will burn out very quickly (I have tested this...)

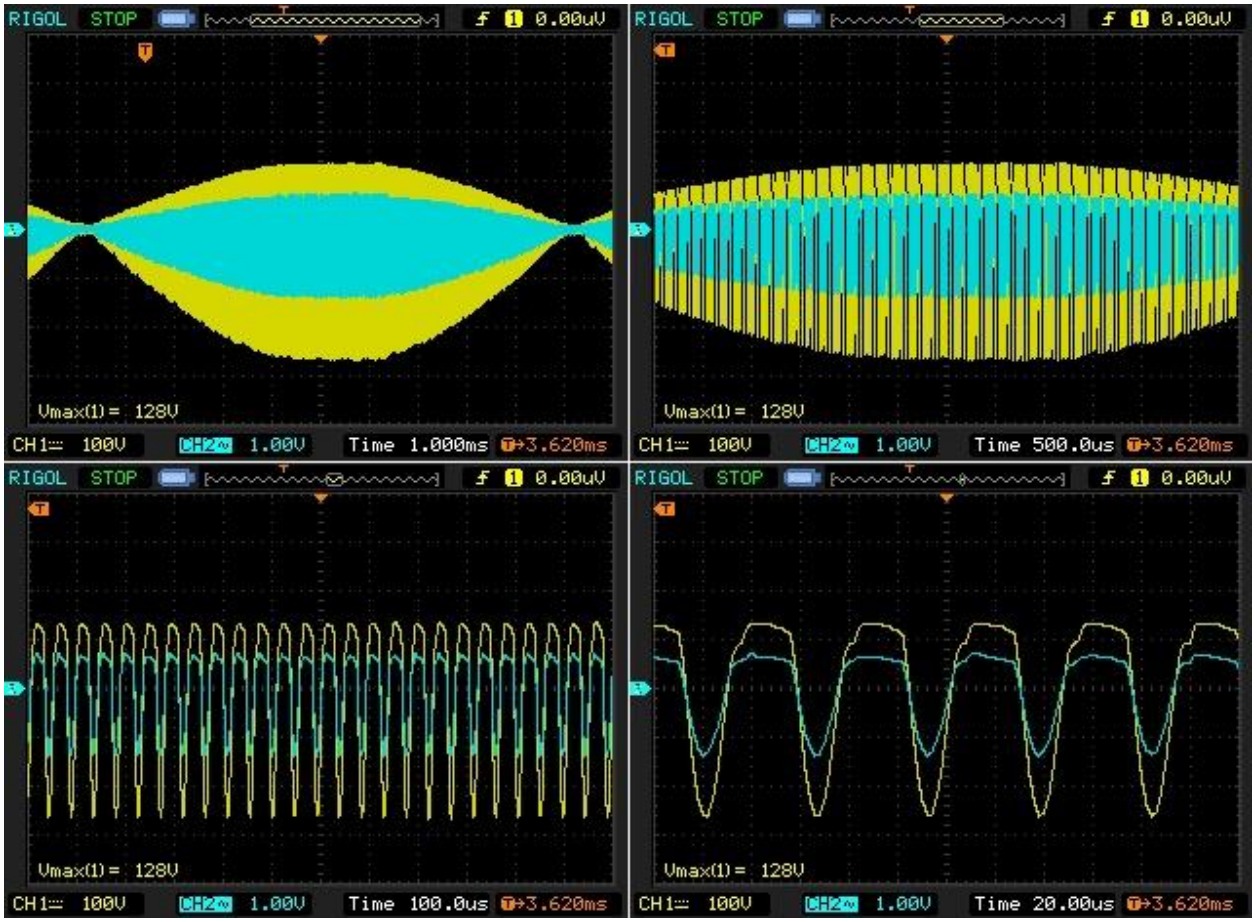
When the power is injected in the power grid through the Grid Tie Inverter (GTI) connected to the input of the induction cooker, a green chaser light of LEDS will run on the front of the GTI; the speed of this chaser light is proportional to the power injected. The DC voltage at the input of the GTI is monitored with a digital scope, a Fluke123.

It is possible to adjust manually the amount of power re-injected, simply by moving the feed-back coil on the induction cooker. So, we are able to adjust the power ratio between the output power on the halogen lamps and the re-injected power.

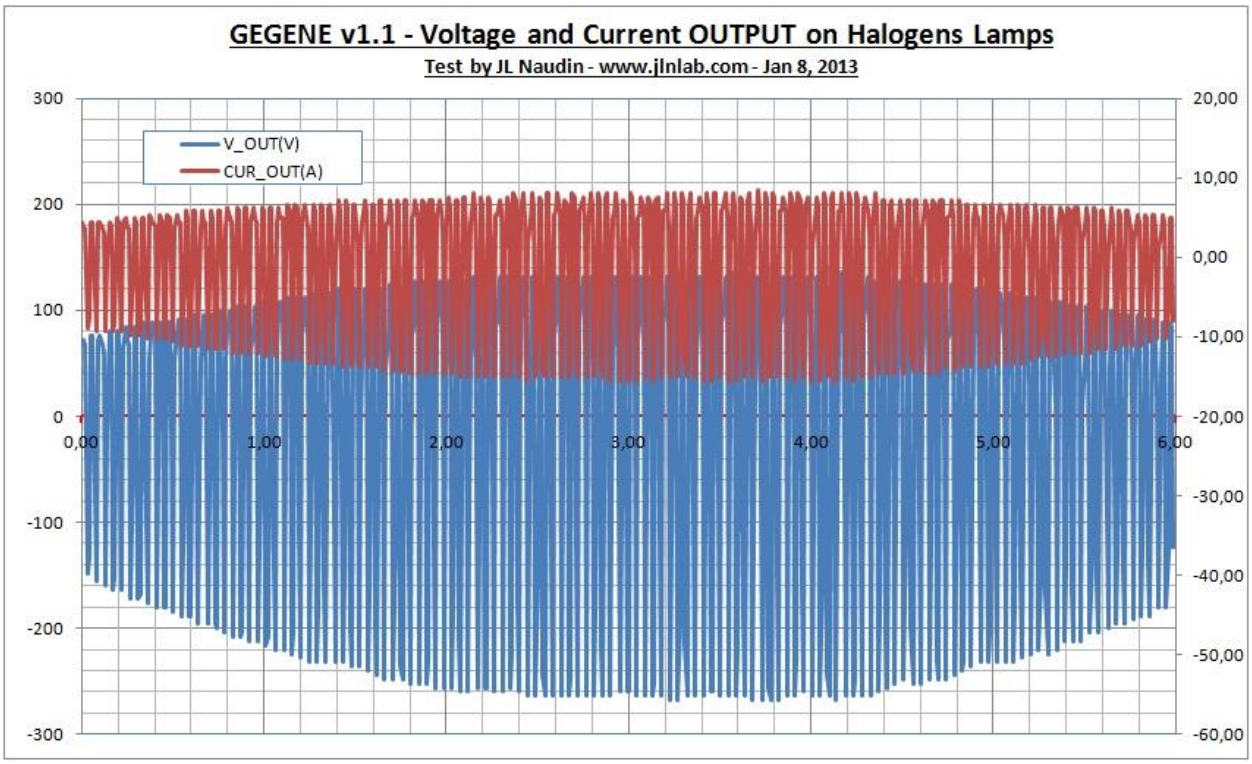


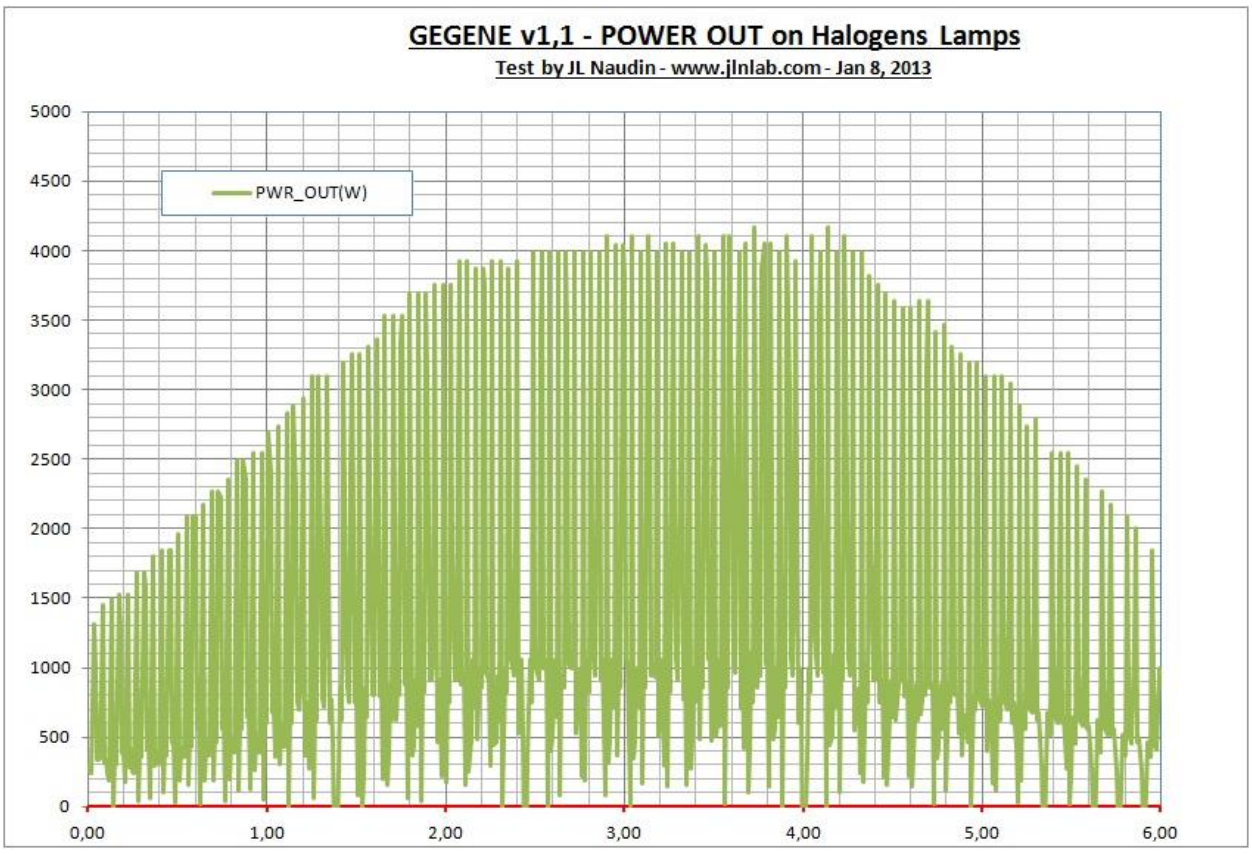
In this test, I have used 1 set of halogen tubes: ((2 x 240 W) + (1 x 400 W)) + (2 x 500 W).

The **TOTAL POWER** connected at the **OUTPUT** of the GEGENE is **1880 Watts**.



The power I/O measurements above have been done with a common digital oscilloscope. The two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current i.e., the voltage across a 0.1 Ohm non inductive resistor, Mundorf MR10 10W. Then the data are sent to a datasheet to compute true RMS values and the efficiency.

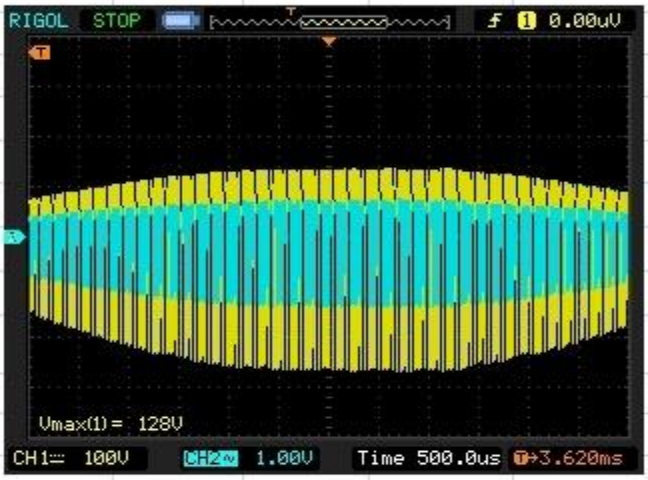

GEGENE v1.1 - Voltage and Current OUTPUT on Halogens Lamps
Test by JL Naudin - www.jlnlab.com - Jan 8, 2013
V_OUT(V)
CUR_OUT(A)
300
200
100
0
-100
-200
-300
20,00
10,00
0,00
-10,00
-20,00
-30,00
-40,00
-50,00
-60,00
0,00
1,00
2,00
3,00
4,00
5,00
6,00


GEGENE v1,1 - POWER OUT on Halogens Lamps
Test by JL Naudin - www.jlnlab.com - Jan 8, 2013
PWR_OUT(W)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0,00
1,00
2,00
3,00
4,00
5,00
6,00

The measurements of the power P1 coming from the power grid and the electrical power P2 required for the induction cooker are done with two Wattmeters, Energy Logger 4000F. The power re-injected by the GTI can be easily calculated by subtracting the powers: P2 minus P1.

In the measurements bellow : P1 (power from the grid) = 751.6 Watts and P2 (total power required by the GEGENE) = 991.3 Watts, this gives a re-injected power P2 - P1 = **+240 Watts** knowing that there is **1880 Watts** of halogens lamps powered by the GEGENE at the same time...

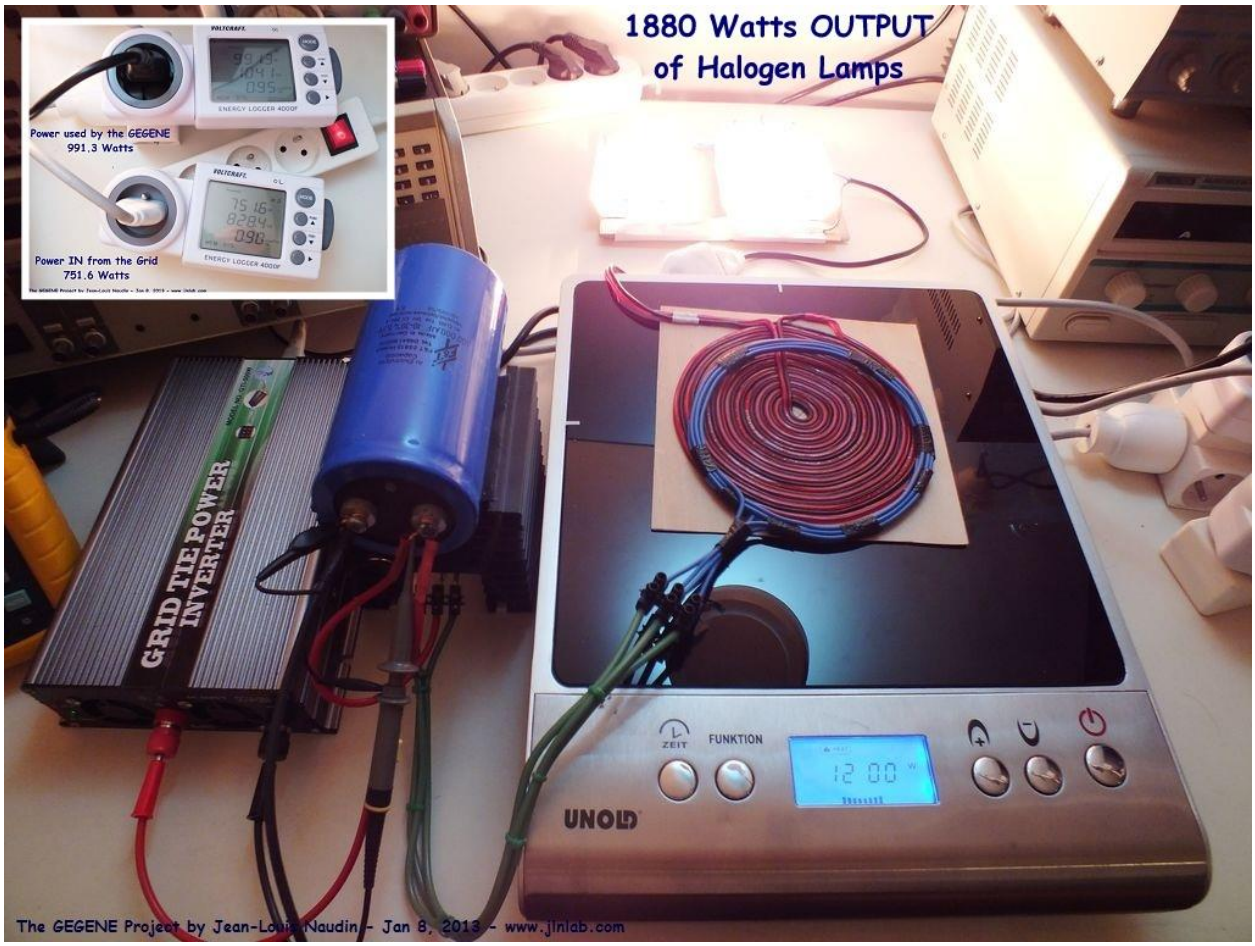
The GEGENE v1,1 test by Jean-Louis Naudin (www.jlnlab.com)



TEST 10a	08/01/2013
OUTPUT (rms)	
VTG(rms)	
151,10	
CUR(rms)	Rprobe
8,73	0,09
PWR INJECTED	240
GridPWR_INP	751,6

The current probe resistor is NON INDUCTIVE

Current probe :	Mundorf resistor MR10 - 10 Watts 0,1 Ohm (real value = 0,09 Ohm)



Here is the video of the closed loop test of the GEGENE v1.1

http://www.youtube.com/embed/-OlLRrTSvYU

This is only the closed loop test **phase 2** of the GEGENE, here below are case studies of various closed loop systems:

- ***CASE 1***: If 1.0 KJ is produced by the grid (measured with the energy-meter on the grid plug), firstly if 1.0 KJ is produced by the generator and secondly if 1.0 KJ is used by the load at the output, there is 1.0 - 1.0 = 0.0 KJ available for re-injection at the input... So, we measure 1.0 KJ on the energy-meter on the grid plug and 1.0 KJ on the energy-meter at the input of the induction cooker after the GTI.
- ***CASE 2***: If 1.0 KJ is produced by the grid (measured with the energy-meter on the grid plug), firstly if 1.5 KJ is produced by the generator and secondly if 1.0 KJ is used by the load at the output, there is 1.5 - 1.0 = 0.5 KJ available for re-injection at the input... So, we measure 1.0 KJ on the energy-meter on the grid plug and 1.5 KJ on the energy-meter at the input of the induction cooker after the GTI.
- ***CASE 3***: If 1.0 KJ is produced by the grid (measured with the energy-meter on the grid plug), firstly if 2.0 KJ is produced by the generator and secondly if 1.0 KJ is used by the load at the output, there is 2.0 - 1.0 = 1.0 KJ available for re-injection at the input... So, we measure 1.0 KJ on the energy-meter on the grid plug and 2.0 KJ on the energy-meter at the input of the induction cooker after the GTI.
- ***CASE 4***: If 1.0 KJ is produced by the grid (measured with the energy-meter on the grid plug), firstly if 2.5 KJ is produced by the generator and secondly if 1.0 KJ is used by the load at the output, there is 2.5 - 1.0 = 1.0 KJ available for re-injection at the input... So, we measure 1.0 KJ on the energy-meter on the grid plug and 2.5

KJ on the energy-meter at the input of the induction cooker after the GTI.

Below, here are the situations corresponding to the cases above:

1. The closed loop is not possible, the system is conservative; it produces as much as it consumes.
2. (**Phase 2**) a closed loop Off the Grid is not yet possible, because the system need to be assisted by the power grid, the system produces more than it consumes but NOT ENOUGH to be Off the Grid. This is the beginning of the validation of a closed loop system.
3. (**Phase 3**) a closed loop is possible here, the system can be disconnected from the grid (if the GTI is replaced by a pure sinus grid inverter). The system is balanced and produces as much as it consumes while it gives power for all the output loads.
4. (**Phase 4**) a closed loop is possible here, the system can be disconnected from the grid (if the GTI is replaced by a pure sinusoidal grid inverter). The system produces MORE than it consumes while it gives power for all the output loads and in addition it is able to charge a battery.

At this moment, I need to find a means to increase the injection power by building a better feed-back coil. The current feed-back coil gives me about 250 Watts of max power for re-injection. If I reduce too much the loads at the output, the system drops to error code E0, the power coupling must be sustained with high power loads (>1000W halogen lamps) to avoid that the system falls. The power of my GTI is limited to 500 W, so I am not able yet to build a full closed loop system Off the Grid. More tests are soon coming...

The tests phases 3 and 4 have not been validated to date...

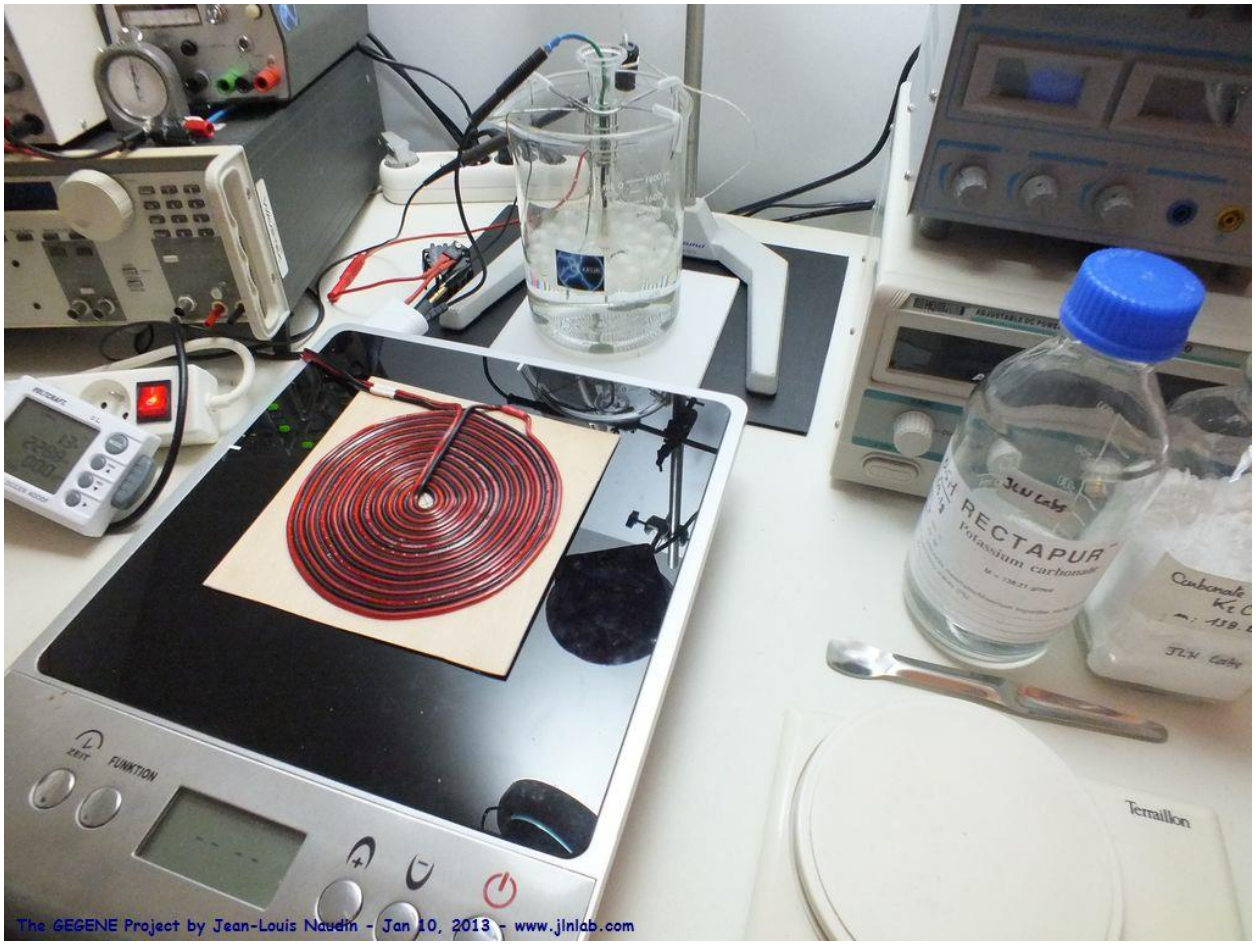
NEXT TESTS:

TEST #10 : High Temperature Plasma Electrolysis with the GEGENE

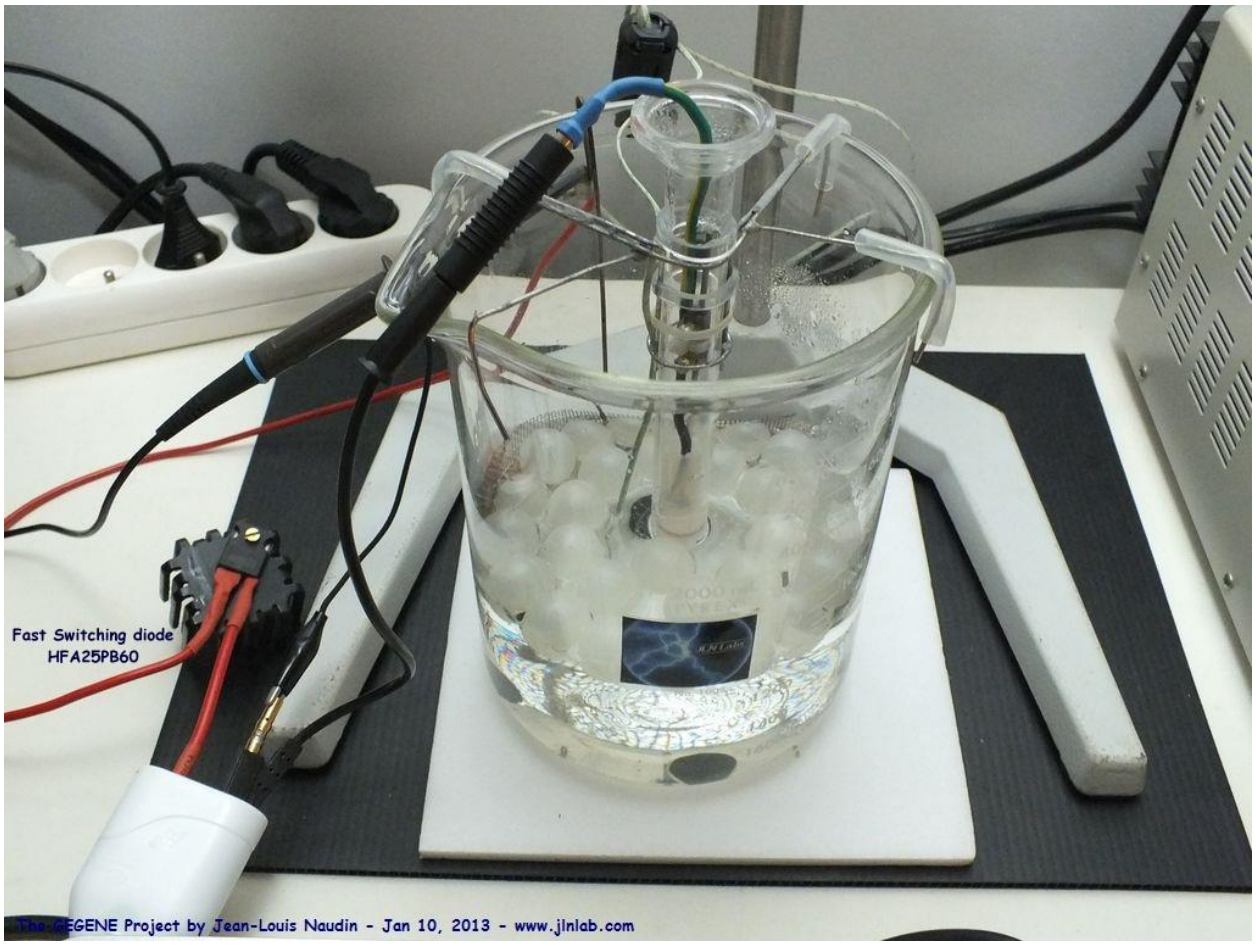
TEST #10: High Temperature Plasma Electrolysis with the GEGENE

January 10, 2013 - TEST #10: Here is an interesting test of electrolysis with the GEGENE v1.1 and with my CFR reactor. In this test the high voltage pulsed signal, available at the output of the flat bifilar Tesla coil, is used to power the CFR basic (Cold Fusion Reactor) that I have tested in November 2005 during experiments about High Temperature Plasma electrolysis (Mizuno type). Today, the purpose of this preliminary experiment is to check if it is possible, with the use of the pulsed and modulated signal at the GEGENE output, to generate a great amount of di-hydrogen gas (or HHO gas) with a better efficiency than a common Faraday electrolysis with DC current and with a lower working temperature than the high temperature plasma electrolysis that I have tested in 2005. This should allow me to solve the problems of aging and wear of the tungsten cathode that I had encountered during the testing. This problem was produced by the very high temperatures around the cathode of the CFR.

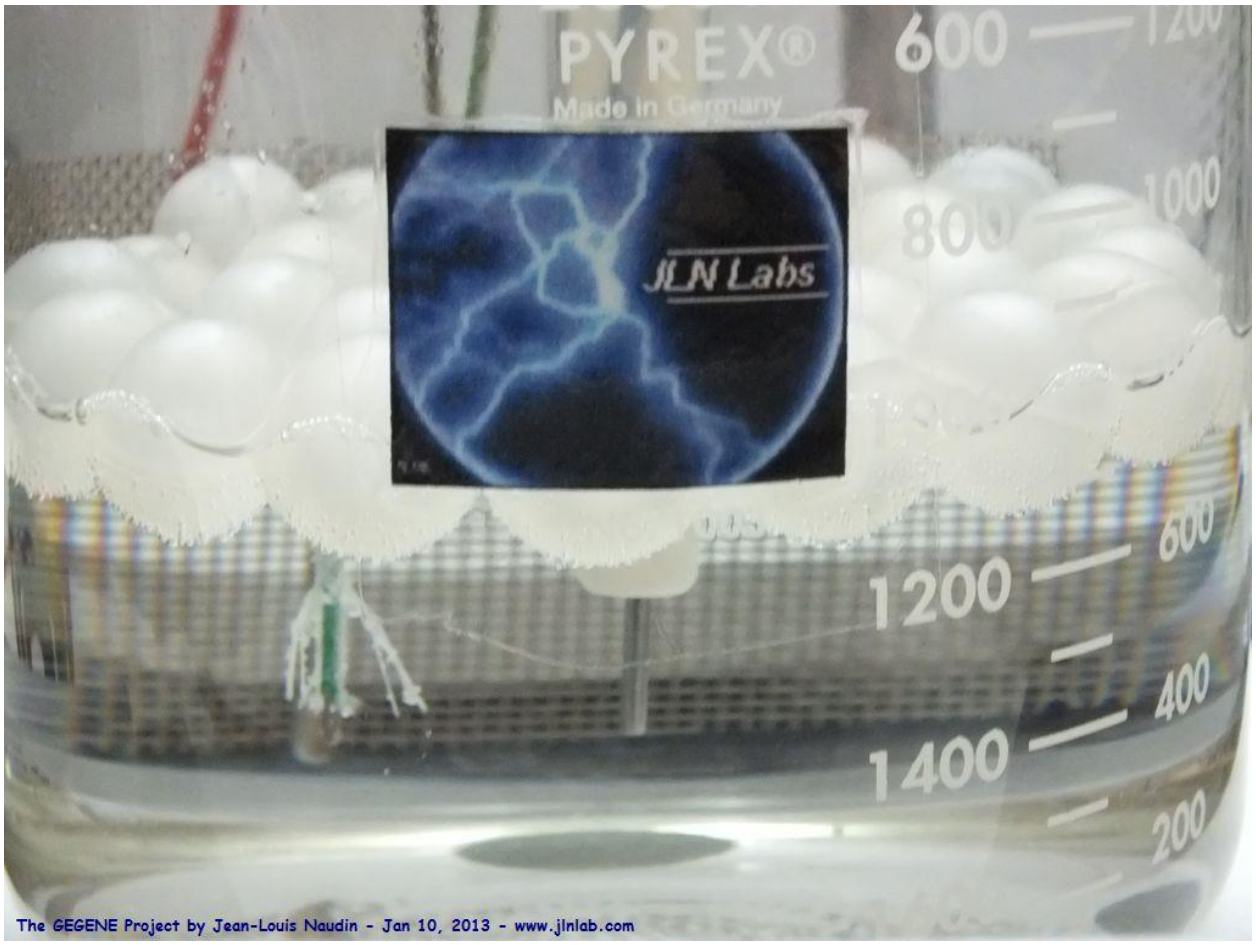
Below is a photo of the tested setup.



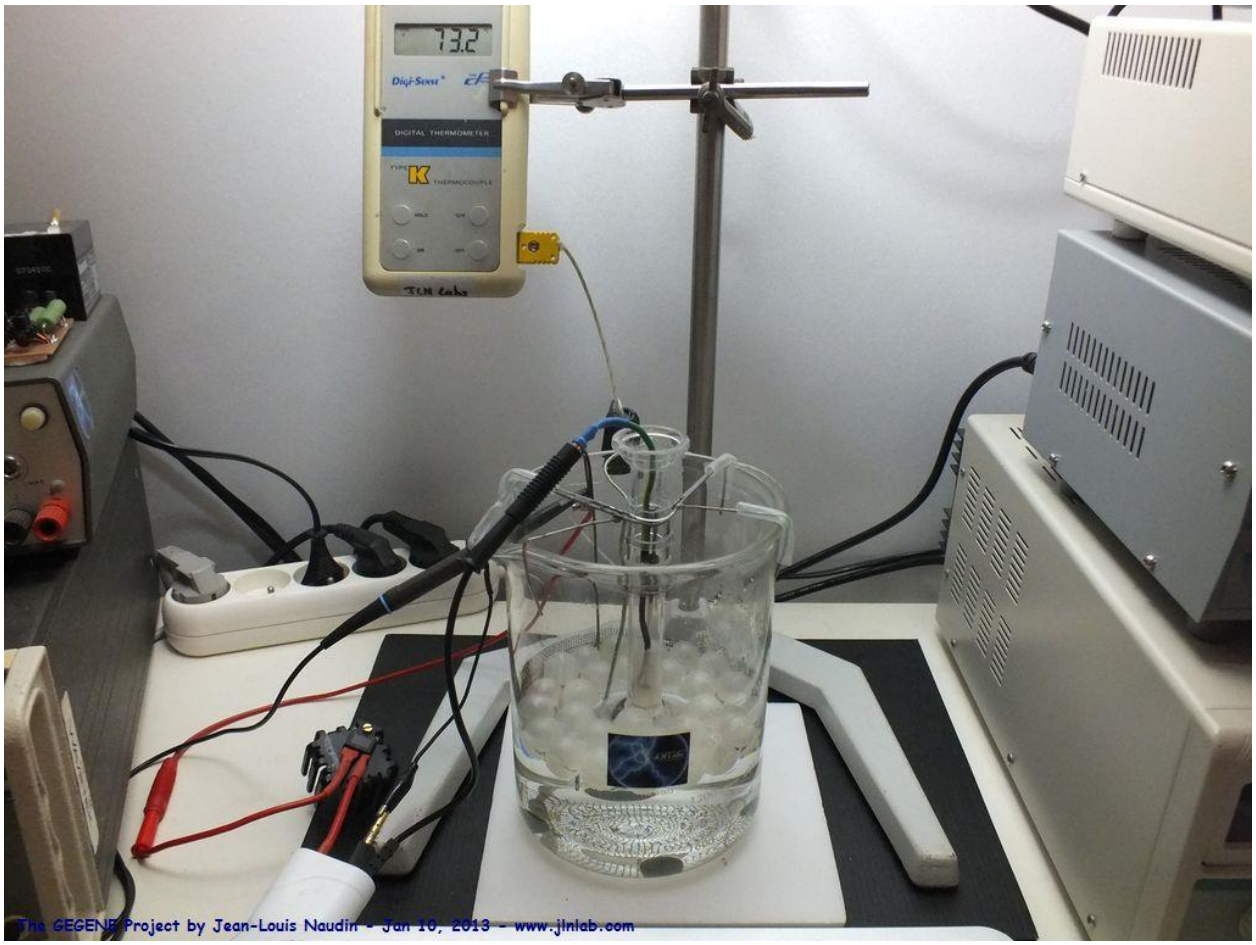
The CFR reactor is connected to the flat bifilar Tesla coil of the GEGENE via a very high speed diode used for the rectifying but used without a filtering capacitor. This allows us to get a pulsed DC signal at high frequency.



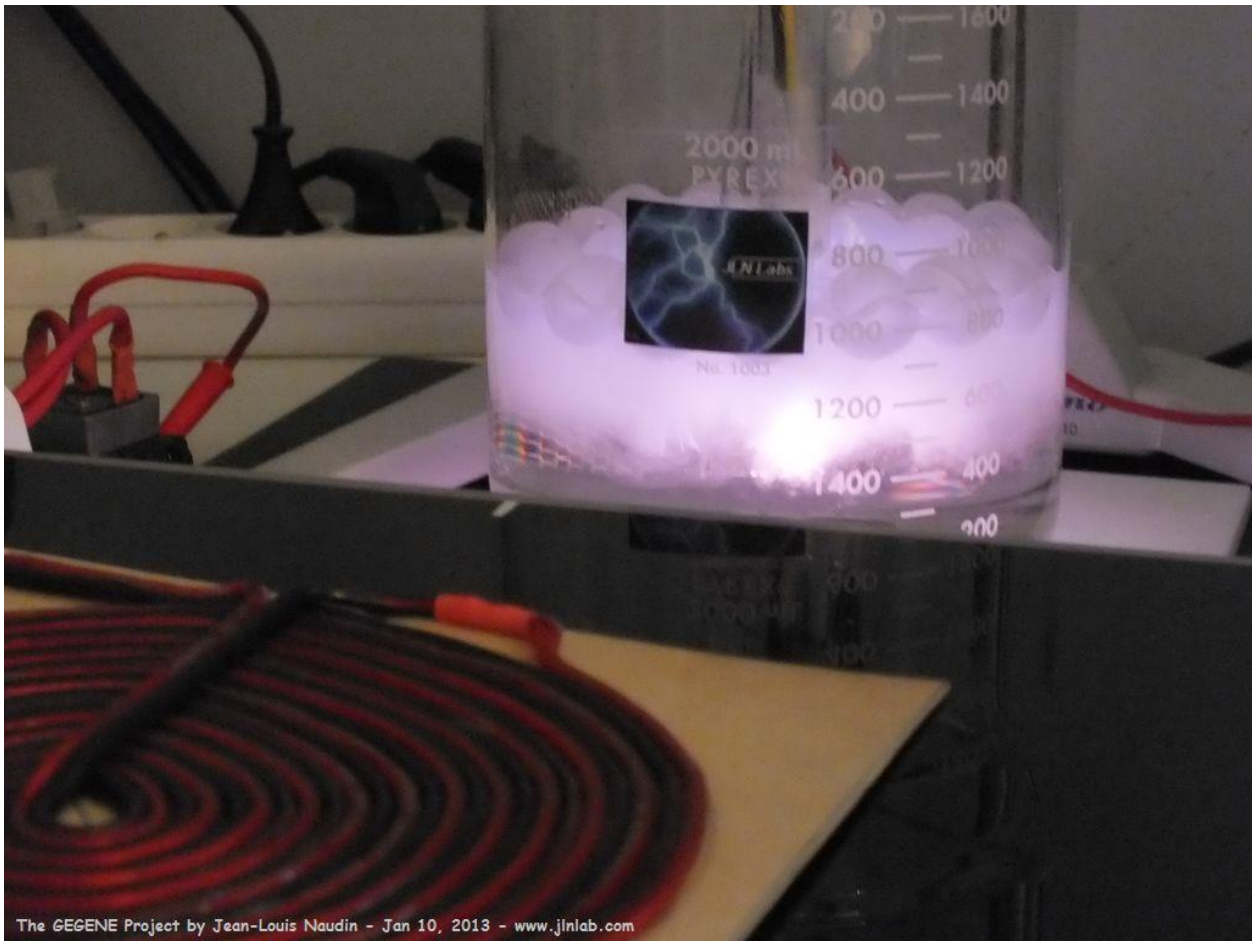
The CFR reactor is filled with 800 mL of a 0.5 M solution of K_2CO_3 (Potassium carbonate). A pure tungsten cathode (3 mm diameter) is used and the anode is a stainless steel grid. The floating balls are used to contain the heat of the reactor and to avoid the "primage" phenomenon.



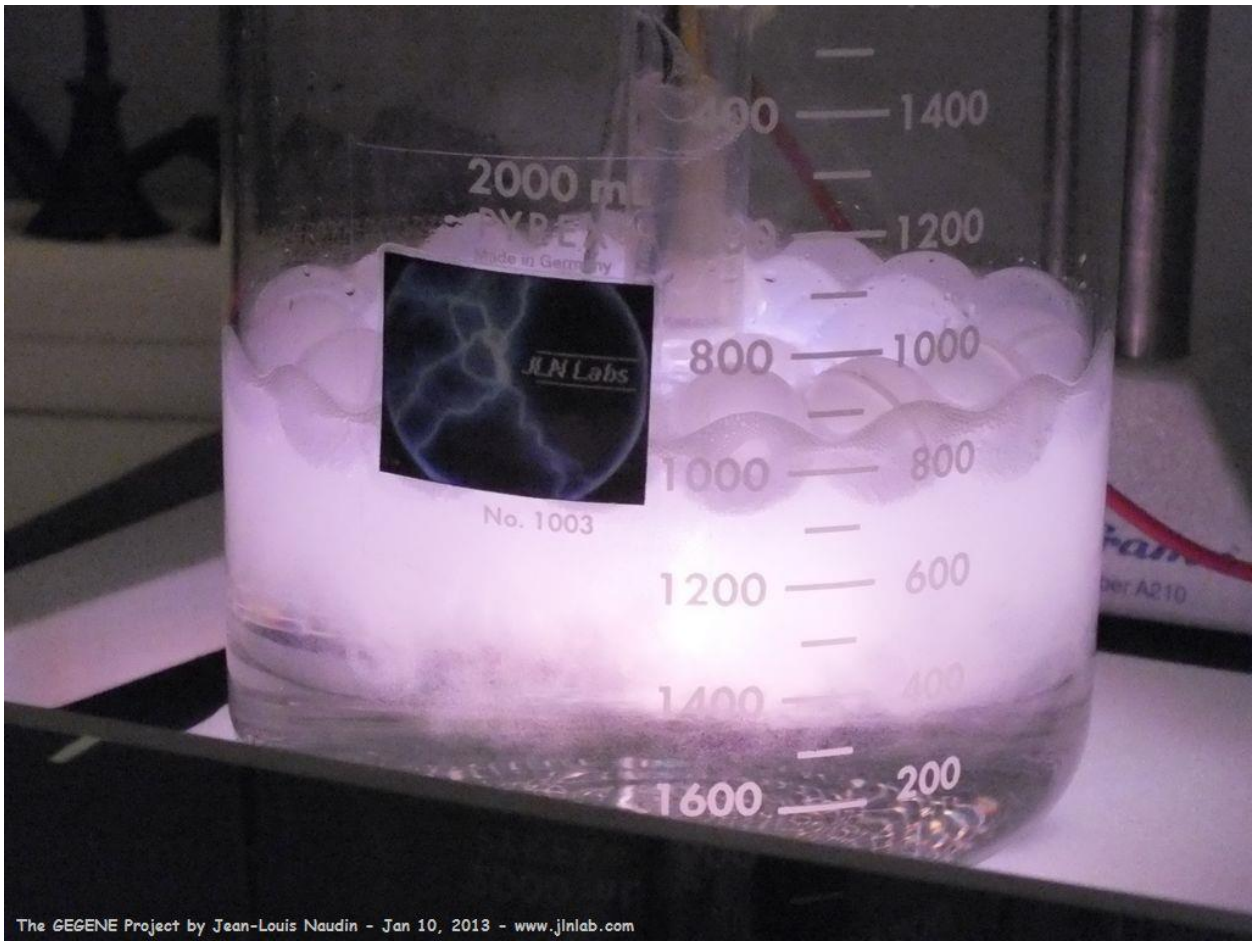
An immersed thermal probe (K type) is connected to a digital thermometer (at the top of the photo below) to control the temperature of the liquid and the ignition point of the plasma in the CFR reactor.



Below the photo of the CFR reactor in action...

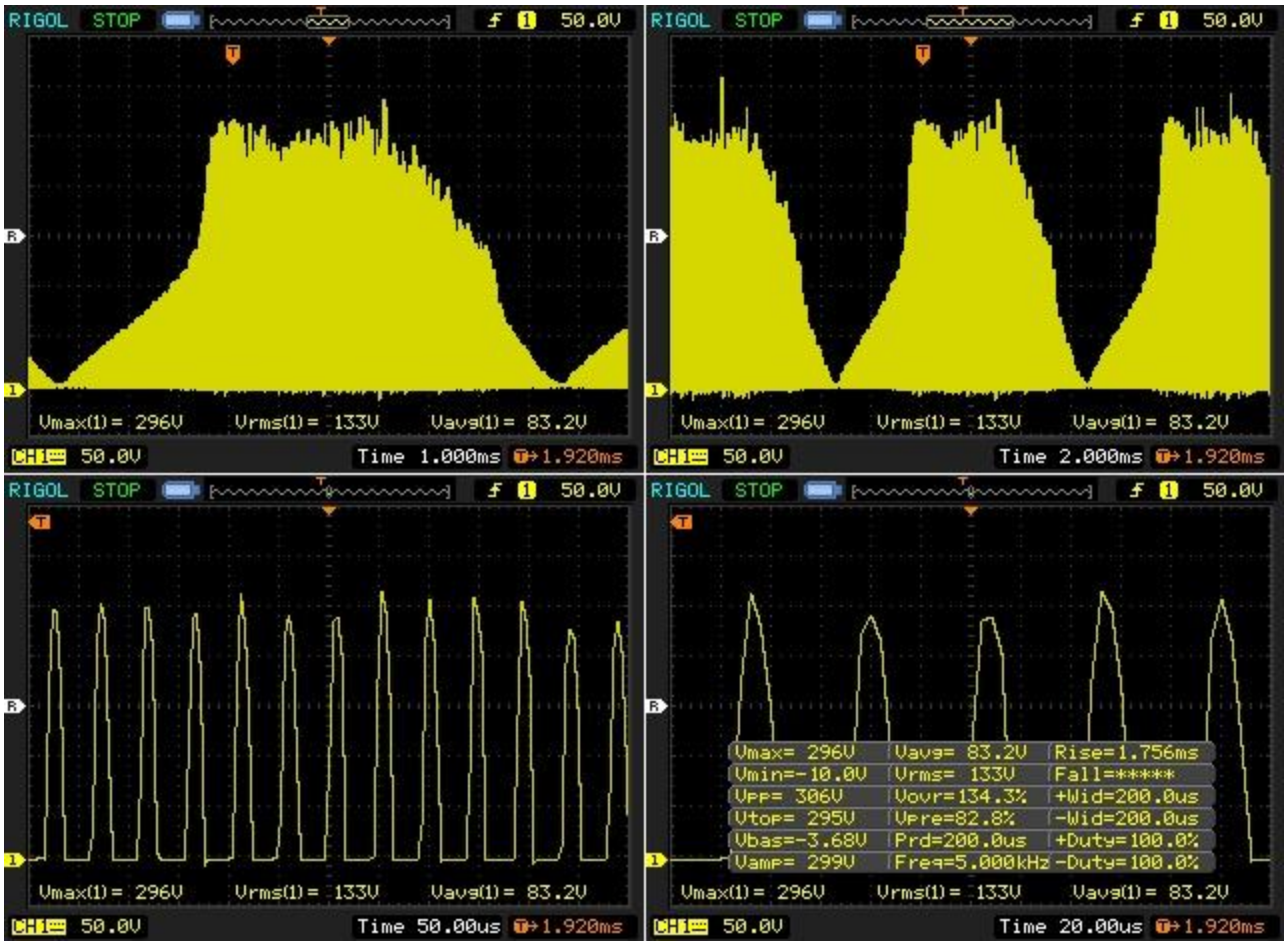


The plasma is clearly visible (purple glow) around the tungsten cathode and it lights completely the reactor.



SUMMARY OF THIS PRELIMINARY EXPERIMENT:

The High Frequency pulsed signal at the GEGENE output allows to ignite the plasma in the CFR reactor.



There is a great amount of di-hydrogen gas produced here with the pulsed setup and the gas micro bubbles are filling very quickly the reactor, hiding the tungsten cathode. I have not yet measured the amount of gas produced and no efficiency measurements have been done yet, this was only a simple proof of concept experiment.

The experimental protocol used in this experiment and all technical details and data about the CFR reactor are widely published HERE.

This simple experiment has allowed me to validate a future design about a high efficiency electrolyzer...

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Hydrogen Evolution by Plasma Electrolysis in Aqueous Solution

Tadahiko MIZUNO*, Tadashi AKIMOTO, Kazuhisa AZUMI[1], Tadayoshi OHMORI[2], Yoshiaki AOKI[3] and Akito TAKAHASHI[4]

Division of Quantum Energy Engineering, Graduate School of Engineering, Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo 060-8628, Japan
[1]*Division of Molecular Science, Graduate School of Engineering, Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo 060-8628, Japan*
[2]*Catalysis Research Center, Hokkaido University, Kita 11 Nishi 10, Kita-ku, Sapporo 060, Japan*
[3]*Center for Advanced Research of Energy Technology of Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo 060-8628, Japan*
[4]*Department of Nuclear Engineering, Graduate School of Engineering, Osaka University, 2-1 Yamadaoka, Suita, Osaka 565-0871, Japan*

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Hydrogen has recently attracted attention as a possible solution to environmental and energy problems. If hydrogen should be considered an energy storage medium rather than a natural resource. However, free hydrogen does not exist on earth. Many techniques for obtaining hydrogen have been proposed. It can be reformulated from conventional hydrocarbon fuels, or obtained directly from water by electrolysis or high-temperature pyrolysis with a heat source such as a nuclear reactor. However, the efficiencies of these methods are low. The direct heating of water to sufficiently high temperatures for sustaining pyrolysis is very difficult. Pyrolysis occurs when the temperature exceeds 4000°C. Thus plasma electrolysis may be a better alternative, it is not only easier to achieve than direct heating, but also appears to produce more hydrogen than ordinary electrolysis, as predicted by Faraday's laws, which is indirect evidence that it produces very high temperatures. We also observed large amounts of free oxygen generated at the cathode, which is further evidence of direct decomposition, rather than electrolytic decomposition. To achieve the continuous generation of hydrogen with efficiencies exceeding Faraday efficiency, it is necessary to control the surface conditions of the electrode, plasma electrolysis temperature, current density and input voltage. The minimum input voltage required induce the plasma state depends on the density and temperature of the solution, it was estimated as 120 V in this study. The lowest electrolyte temperature at which plasma forms is ~75°C. We have observed as much as 80 times more hydrogen generated by plasma electrolysis than by conventional electrolysis at 300 V. [DOI: 10.1143/JJAP.44.396]

KEYWORDS: plasma electrolysis, hydrogen generation, current efficiency, pyrolysis

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NEXT TEST:

TEST #11 : Test of the flat bifilar coil v1.1 with a new induction cooker

TEST #11: Test of the Flat Bifilar Coil v1.1 with a New Induction Cooker

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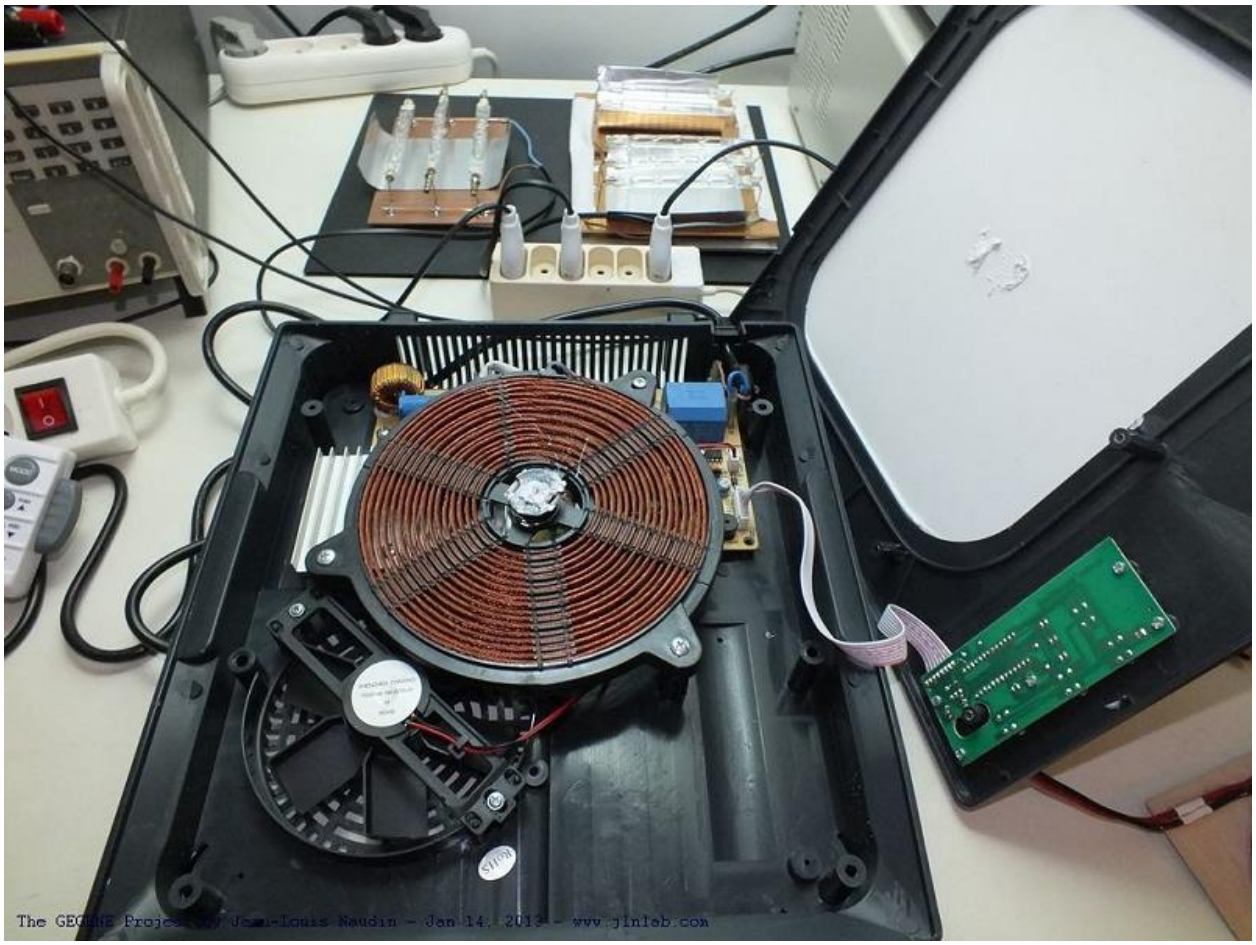
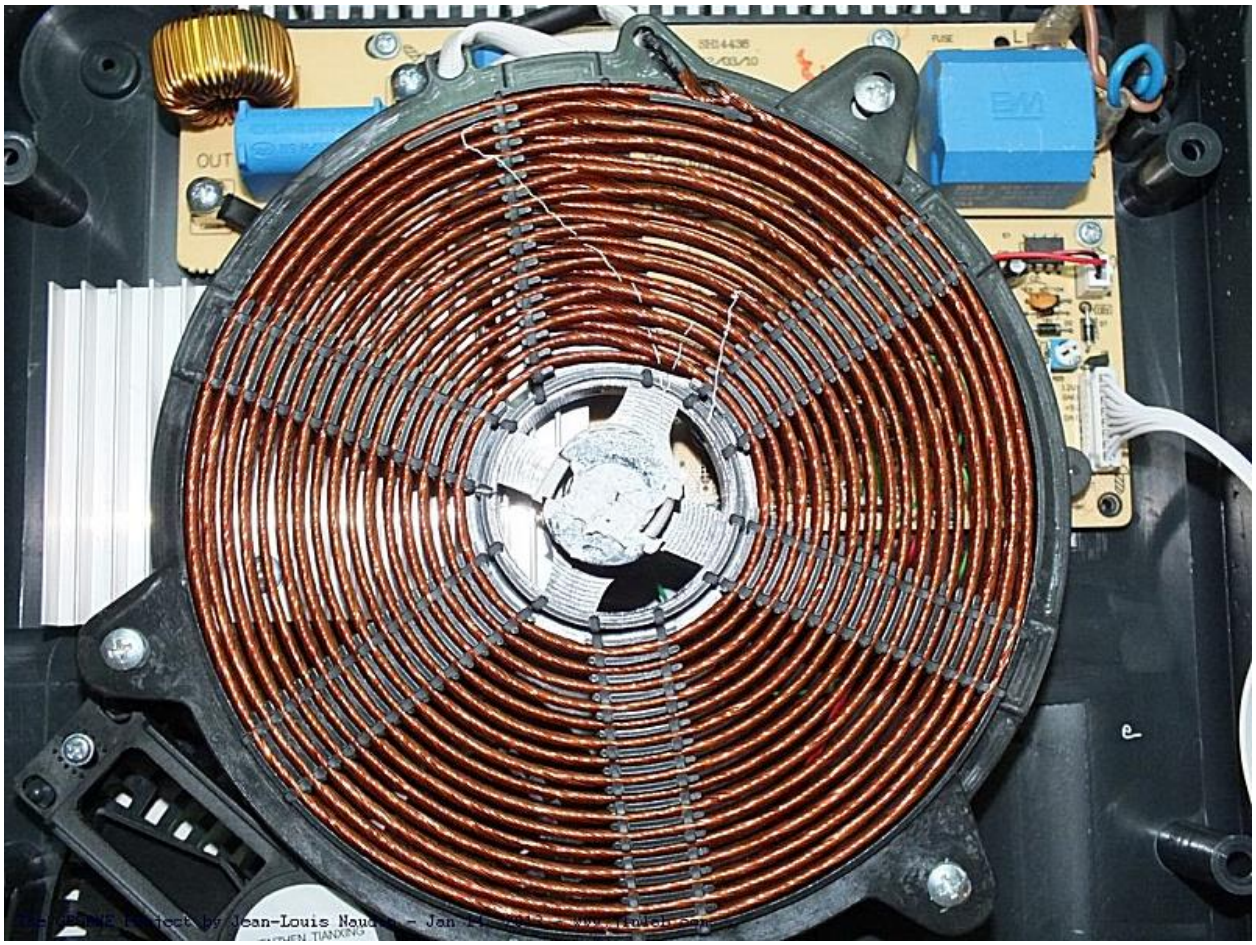
January 14, 2013 - TEST #11: Here is a test of the coil v1.1 with a new induction cooker manufactured by "Rosenstein & Söhne," and with the reference NC-3050. This model of induction cooker is sold for less than 40€ and it is able to give a max power of 1800 Watts and an average power of 1200 W in 10 programmable steps.

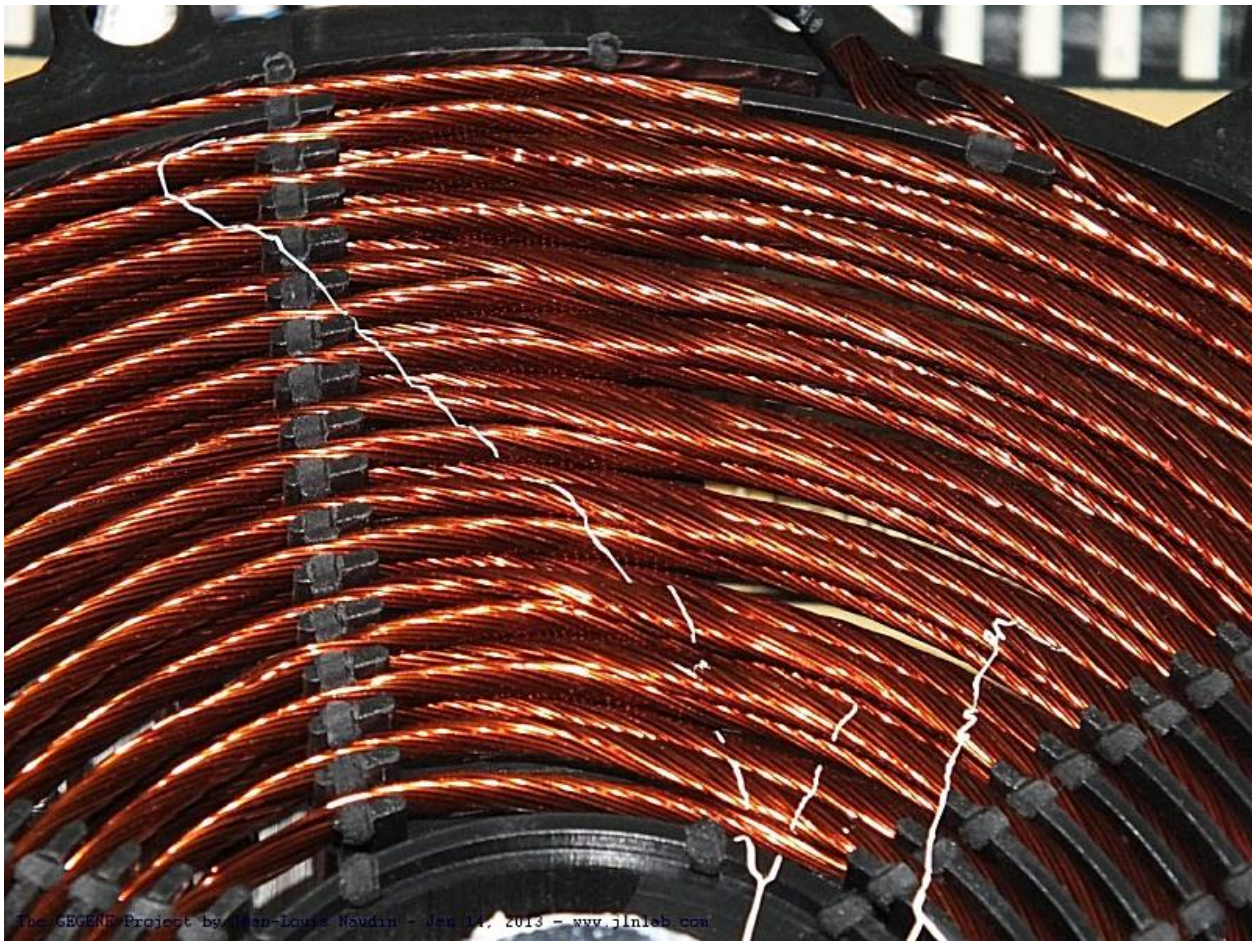
Below some photos of the inside of this induction cooker:



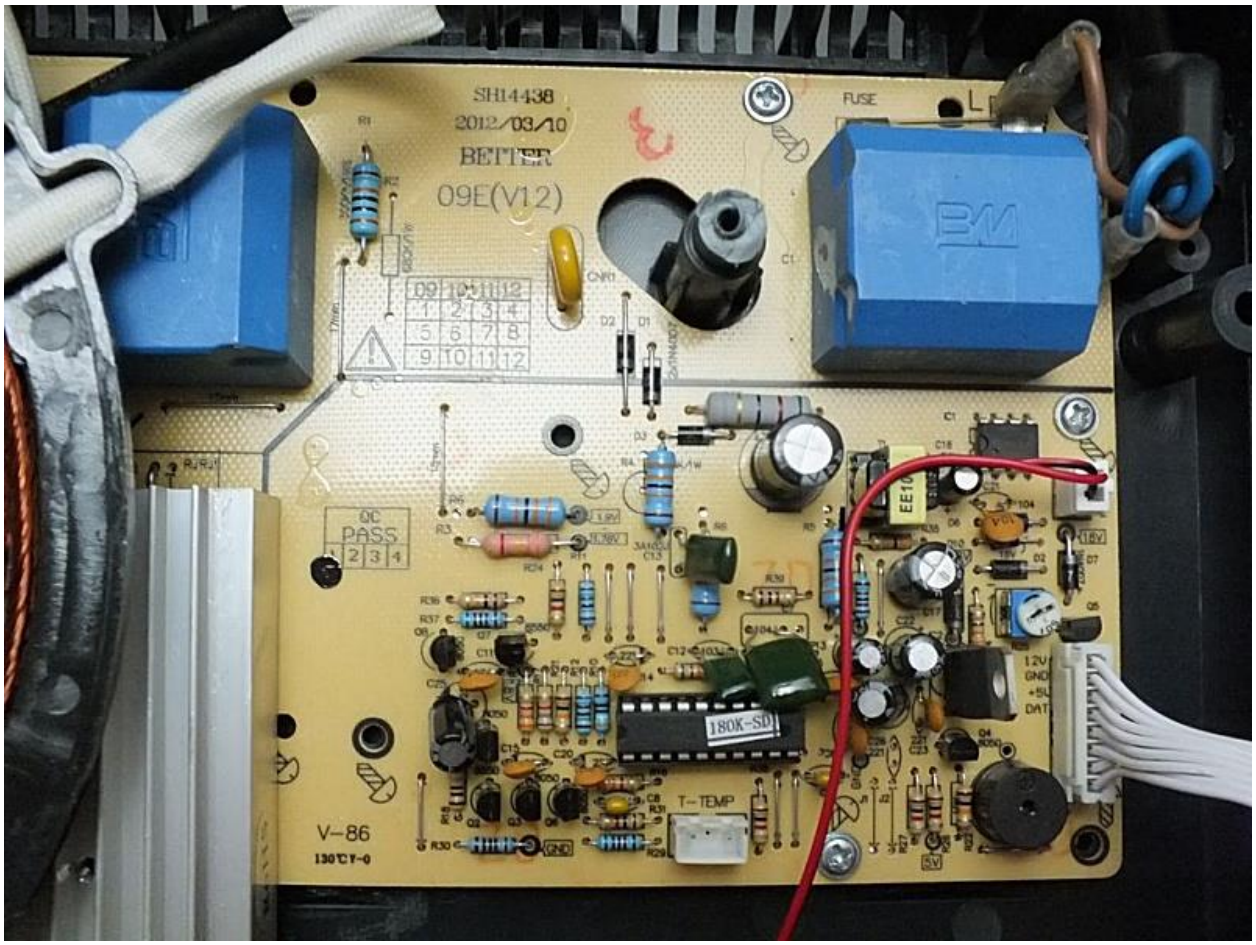
The coil of the induction cooker is made with Litz wire, but the wiring setup is a bit different from the previous tested version.



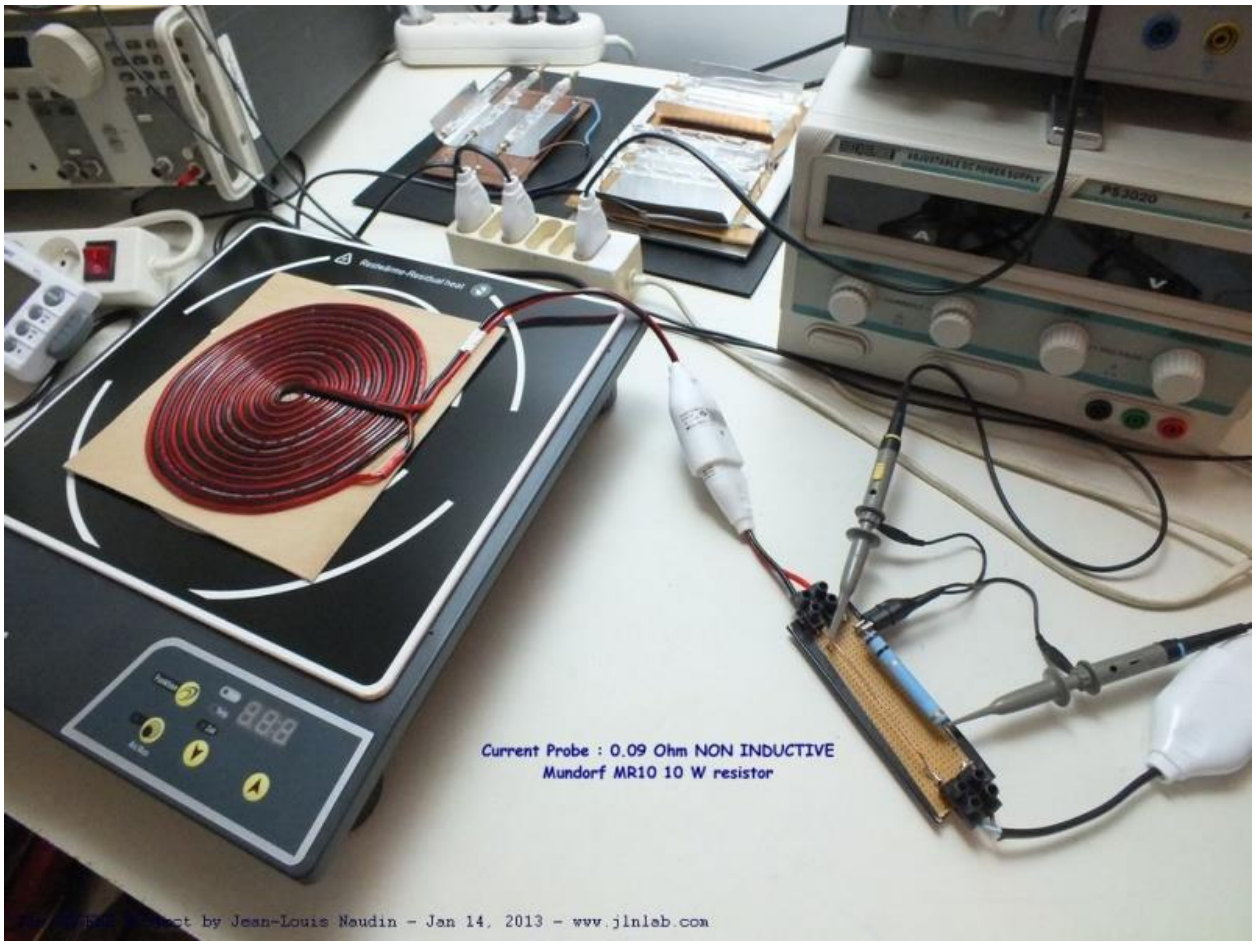
The induction coil is made with spaced turns on two interleaved layers...



Below the electronic control board which drives the induction coil.



To measure the voltage and the current at the output for powering the halogen lamps, the two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current, i.e., the voltage across a 0.1 Ohm non inductive resistor, Mundorf MR10, 10W. Then the data are sent to a datasheet to compute true RMS values and the efficiency. The electrical power input of the induction cooker is measured with a Wattmeter," Energy Logger 4000F," directly connected on the power grid.

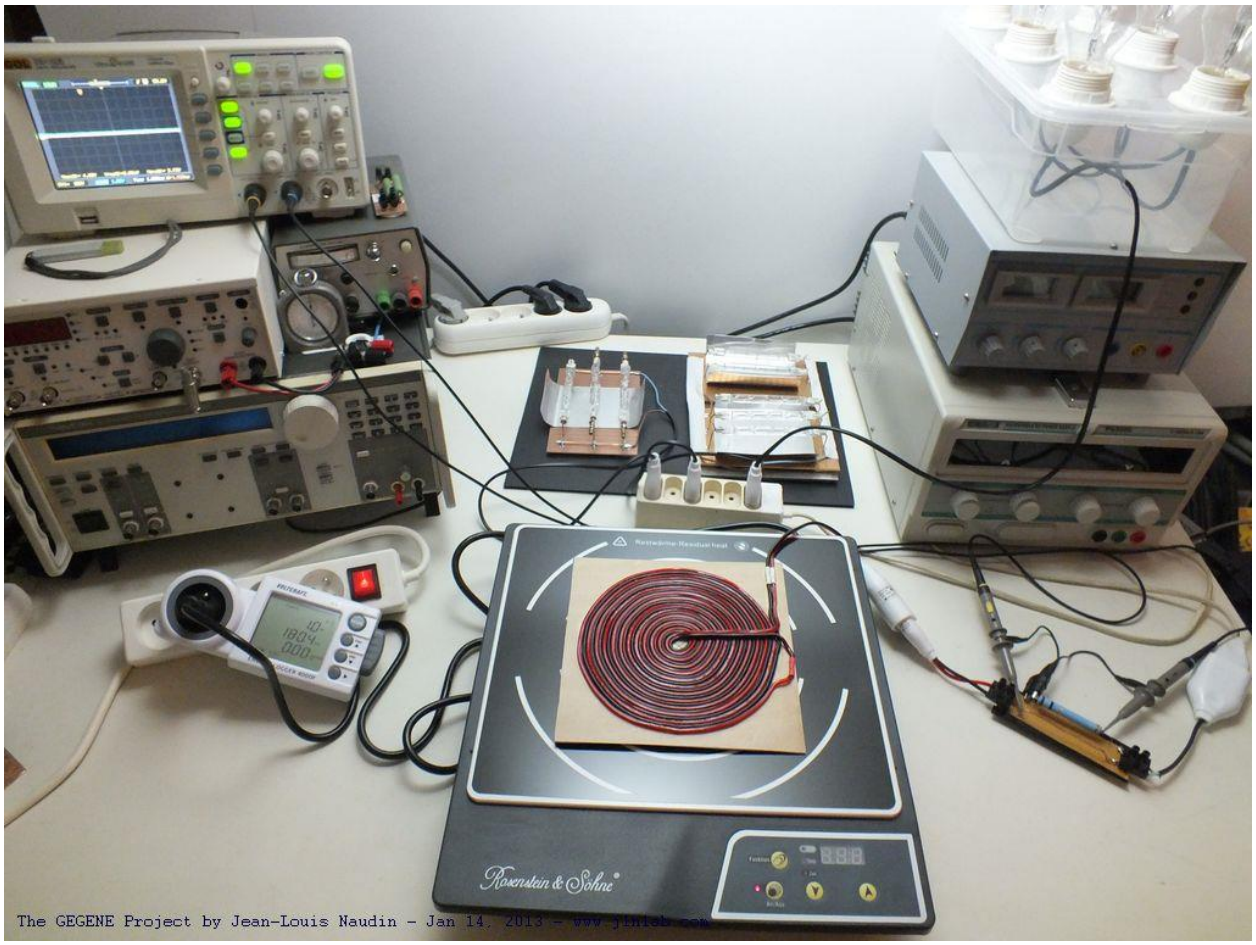


In this test, I have used the same setup of halogen lamps as for the TEST#5, there are:

- 1 box of 6 halogen lamps of 105 W
- 2 sets of halogen which contains:
  - 1 set of halogen tubes: ((2 x 240 W) + (1 x 400 W)) + (2 x 500 W)
  - 1 set of halogen tubes: (1 x 240 W) + (2 x 400 W)

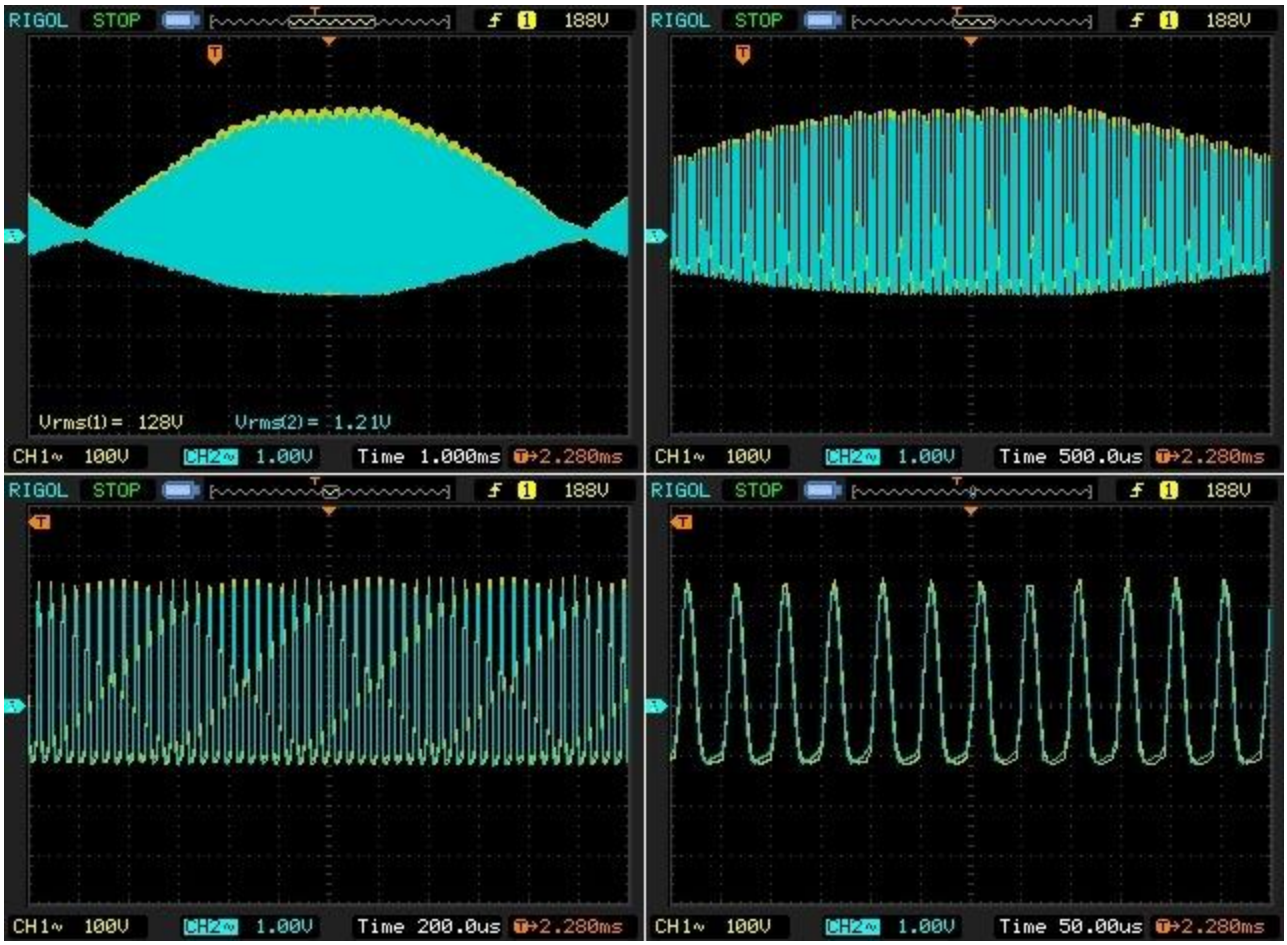
  The **TOTAL POWER** connected at the **OUTPUT** of the GEGENE is **3550 Watts.**

Here is the configuration of the TEST #11:



TEST #11 RESULTS:

The True RMS values of the voltages on the Ch1 and Ch2 are computed in real time by the Rigol digital oscilloscope...



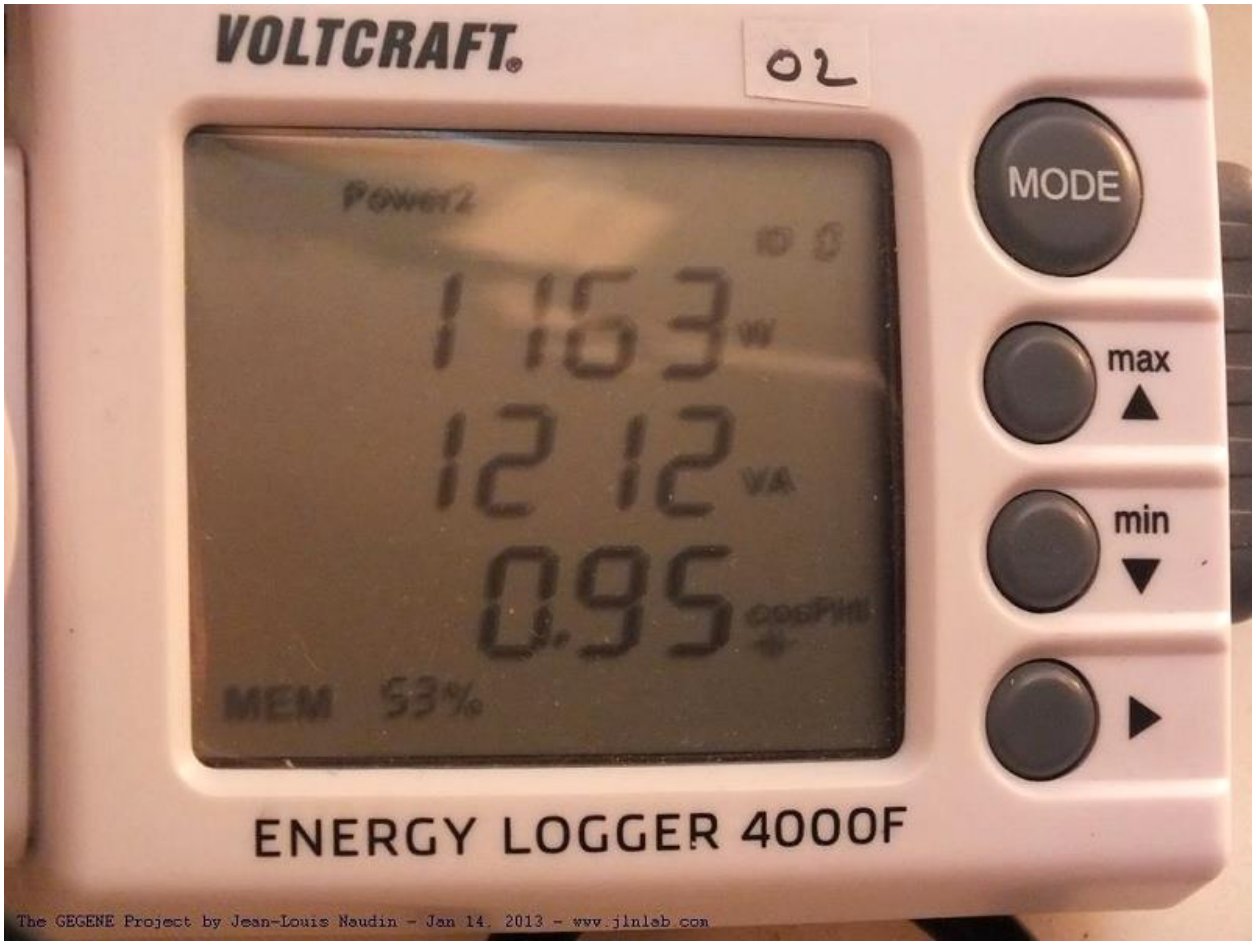
Here is an attempt of a mathematical calculation with the Piecewise Cubic Hermite Interpolating Polynomial (PCHIP) method of the digital data from the oscilloscope, we found:

- U RMS integrated on all the data in Volt (V) with PCHIP:
  Trapeze method : 101.822 Volts RMS
  Simpson method : 101.544 Volts RMS
- I RMS integrated on all the data in Ampere (A) with PCHIP:
  Trapeze method : 10.702 Amperes RMS
  Simpson method : 10.671 Amperes RMS

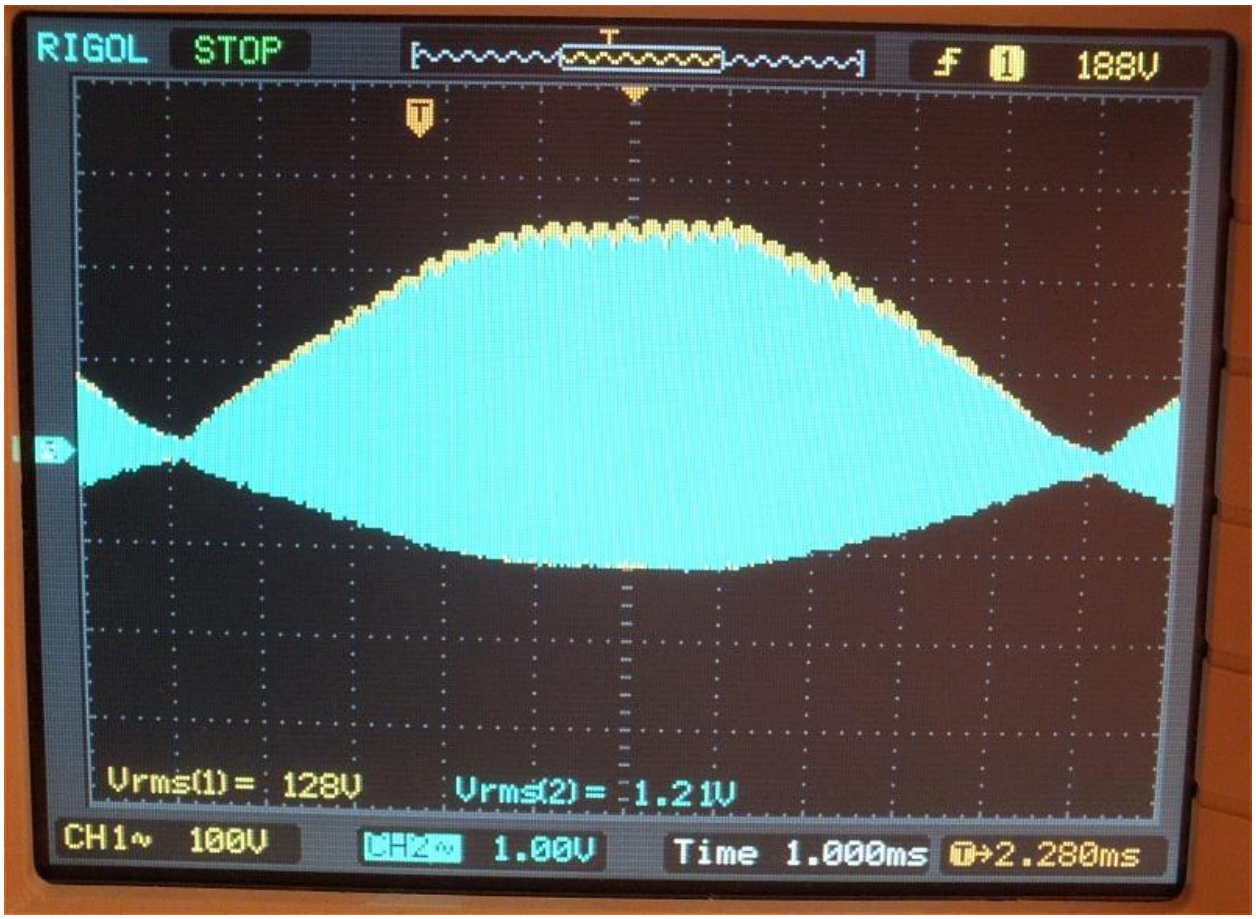
- Average Power integrated on all the data in Watts (W) with PCHIP:
  Trapeze method : 844.482 Watts
  Simpson method : 839.802 Watts

Thanks to Pascuser for his interesting work about this mathematical calculation using the PCHIP method for the computation of the digital data flow coming from the oscilloscope.

The electrical power for the induction cooker is measured with a Wattmeter, Energy Logger 4000F directly connected on the power grid:



The Wattmeter measures 1163 Watt at the INPUT of the induction cooker.



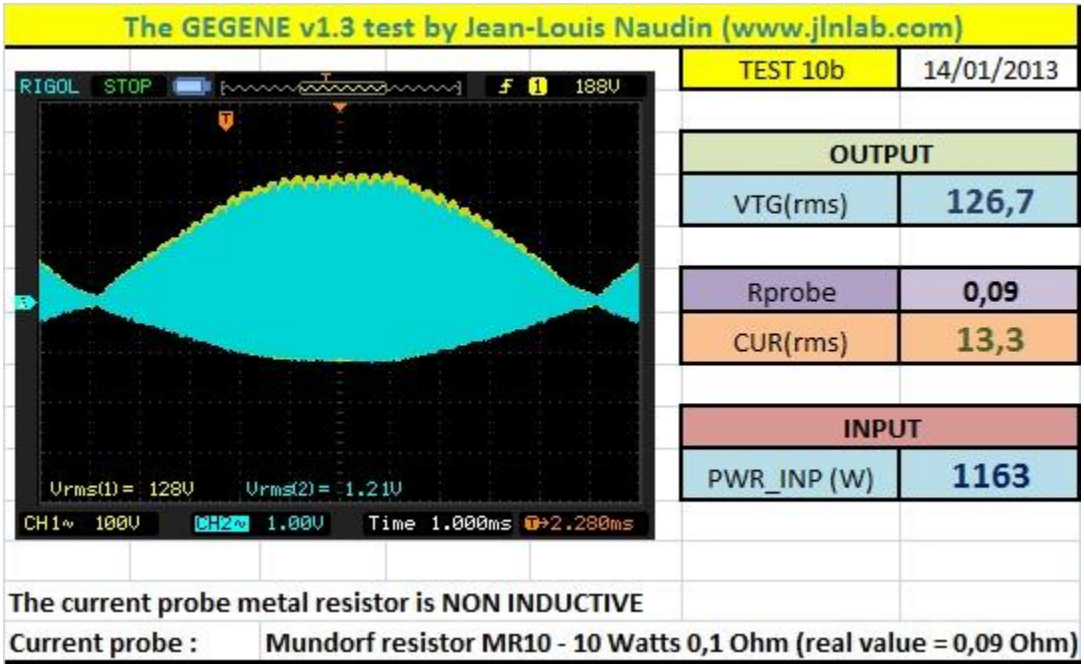
Above the True RMS voltage measured by the Rigol digital oscilloscope.

The True RMS voltage measured across the flat bifilar coil with the probe Ch1 is 128 V RMS.

The True RMS voltage measured across non inductive (metal) resistor of 0.09 Ohm with the probe Ch2 is 1.21 V RMS, which gives a measured current of 13.4 A RMS.

Comments: We can observe that the mathematical PCHIP method to compute the data flow gives very different and lower voltage values

compared to the True RMS voltages measured in real time by the digital oscilloscope. We can also notice that, if we calculate the True RMS values with a datasheet (point to point method) after downloading the data from the oscilloscope, the RMS values calculated with this method are very close to the True RMS values calculated in real time with the Rigol digital oscilloscope. Below the results:



True RMS Voltage (Rigol oscilloscope) = 128 V RMS, computed RMS voltage (datasheet) = 126.7 V RMS,

True RMS Current (Rigol oscilloscope) = 13.4 A RMS, computed RMS current (datasheet) = 13.3 A RMS

Below, the scope data computed with GNU Octave 3.2.4 (freeware and full compatible version of MATLAB).


Octave-3.2.4
>> ver
GNU Octave Version 3.2.4
GNU Octave License: GNU General Public License
Operating System: unknown
no packages installed.
>> power_calc
GEGENE PowerCalc v1.0 - www.jlnlab.com
Read Scope Datas file...
Compute the RMS Voltage and AVG Power ...
Output RMS Voltage for all the datas in Volt (V)   : 126.7 V rms
Output RMS Current for all the datas in Ampere (A) : 13.3 A rms
>> _

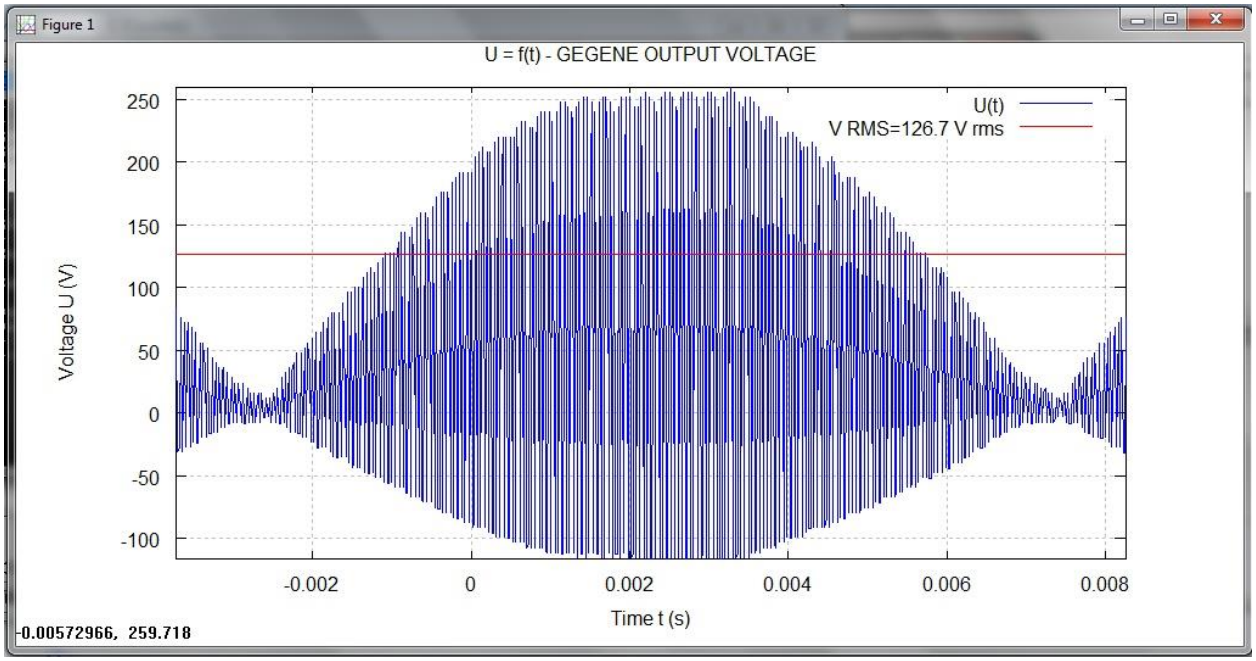


Figure 1
U = f(t) - GEGENE OUTPUT VOLTAGE
U(t)
V RMS=126.7 V rms
Voltage U (V)
Time t (s)
250
200
150
100
50
0
-50
-100
-0.002
0
0.002
0.004
0.006
0.008
-0.00572966, 259.718

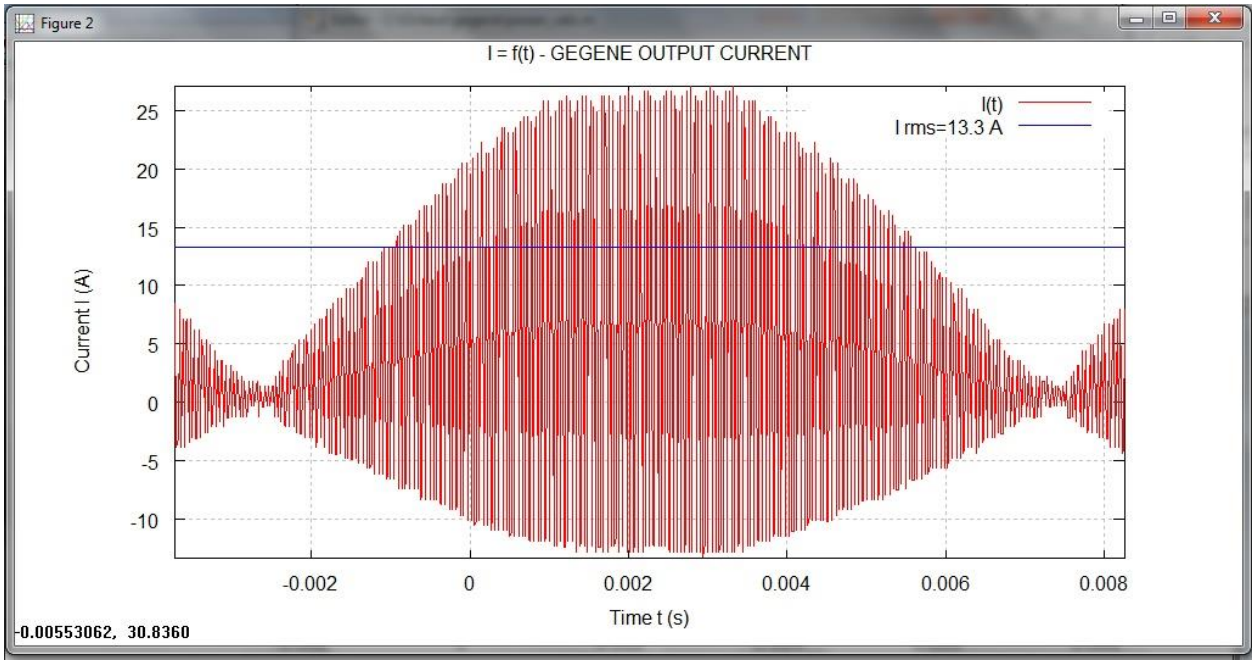


Figure 2
I = f(t) - GEGENE OUTPUT CURRENT
I(t)
I rms=13.3 A
Current I (A)
25
20
15
10
5
0
-5
-10
-0.002
0
0.002
0.004
0.006
0.008
Time t (s)
-0.00553062, 30.8360

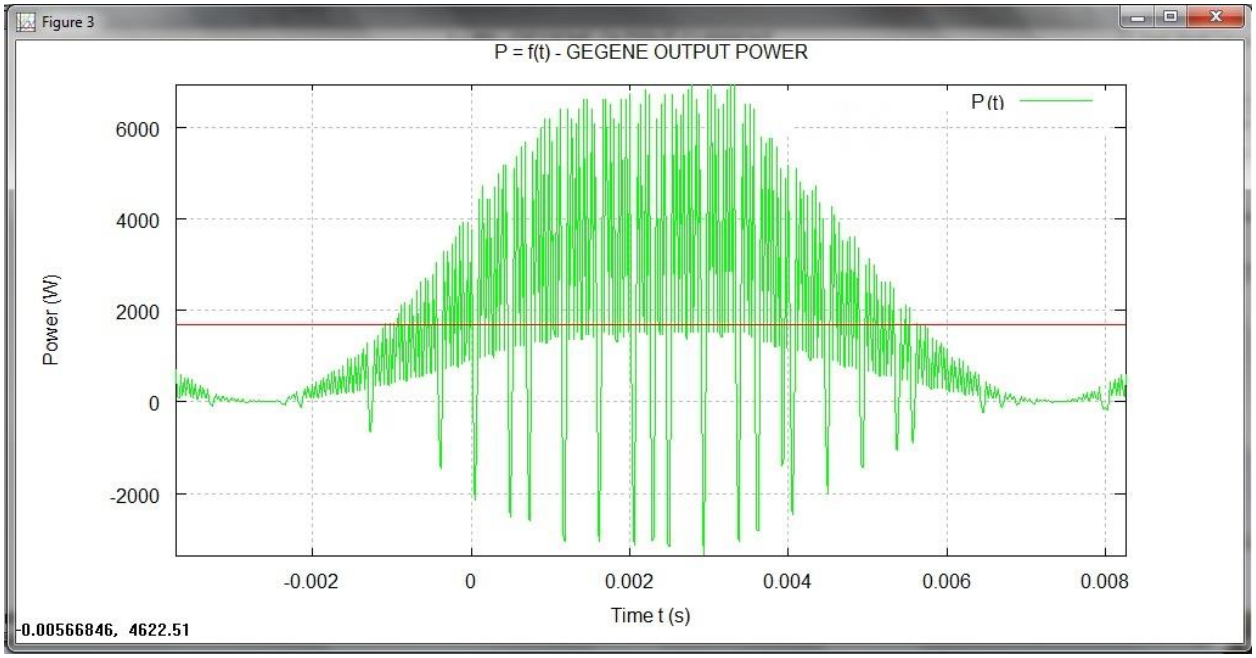


Figure 3
P = f(t) - GEGENE OUTPUT POWER
P (t)
Power (W)
6000
4000
2000
0
-2000
-0.002
0
0.002
0.004
0.006
0.008
Time t (s)
-0.00566846, 4622.51

With this induction cooker model, I don't need to use a ferromagnetic sheet to start the ignition of the halogen lamps.

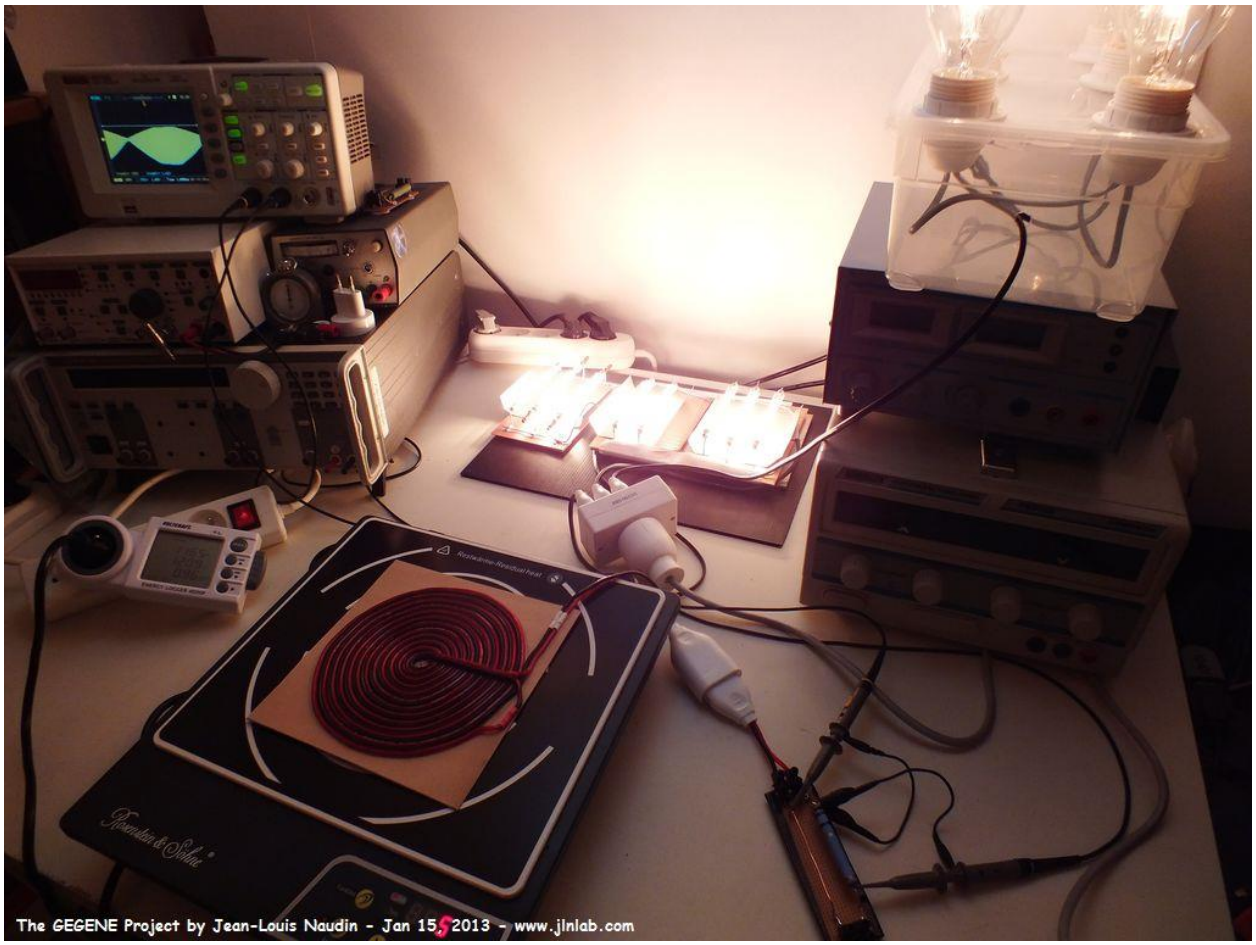
NEXT TEST:

TEST #12: New measurements with the flat bifilar coil v1.1 and the new induction cooker

TEST #12: New Measurements with the Flat Bifilar Coil v1.1 and the New Induction Cooker

---

January 15, 2013 - TEST #12: Here is a new test with the flat bifilar coil v1.1 and the new induction cooker manufactured by "Rosenstein & Söhne", and with the reference NC-3050. In this test, the output power has been limited to the level 5/10 i.e., at the middle power (about 1200 W).



This model of induction cooker is very appreciable because I don't need to use a ferromagnetic sheet to start the ignition of the halogen lamps.

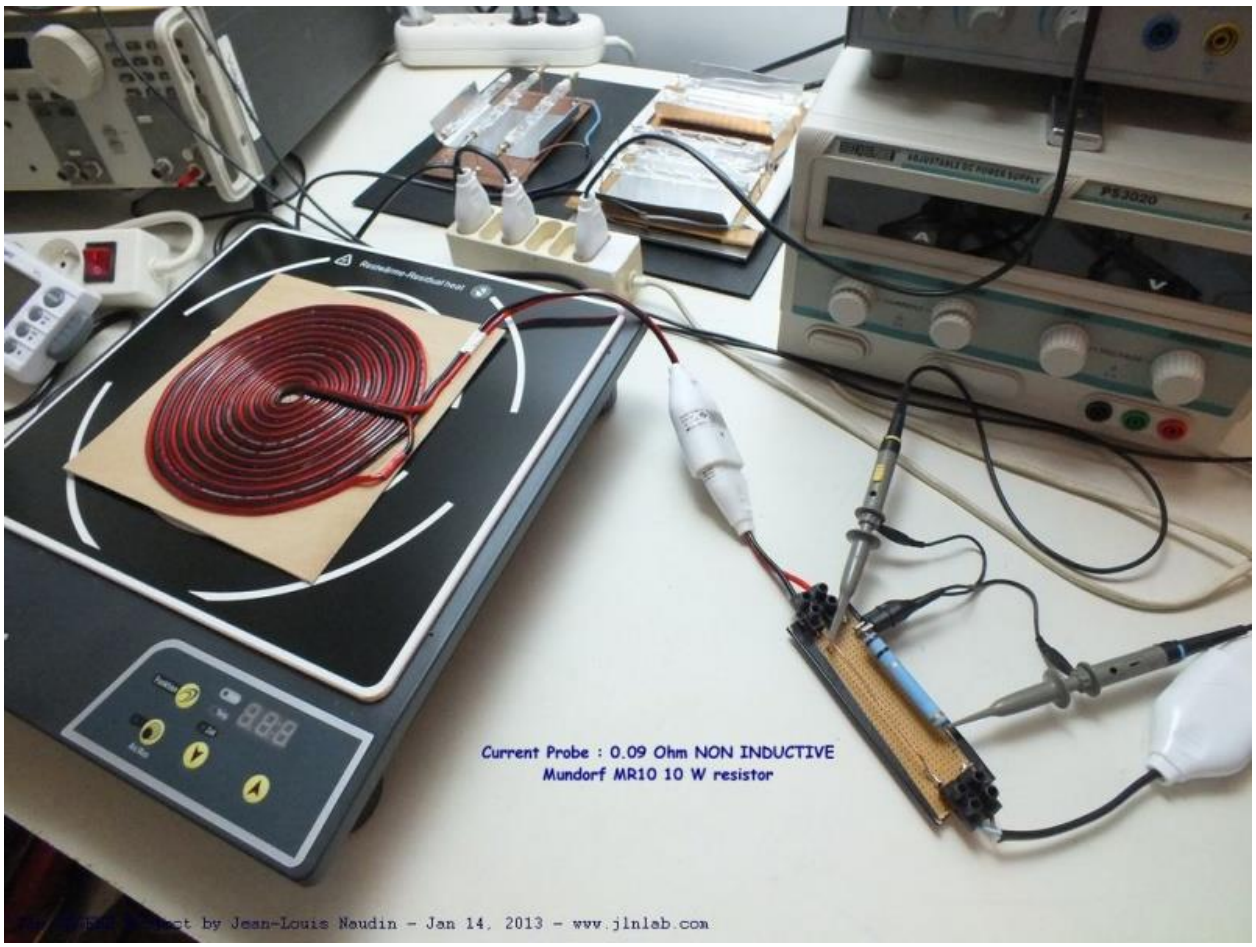
In this test, I have used this setup below of halogen lamps as loads:

- 1 box of 6 halogen lamps of 105 W
- 2 sets of halogen which contains :
  - 1 set of halogen tubes : ((2 x 240 W) + (1 x 400 W)) + (2 x 500 W)
  - 1 set of halogen tubes : (1 x 240 W) + (2 x 400 W)

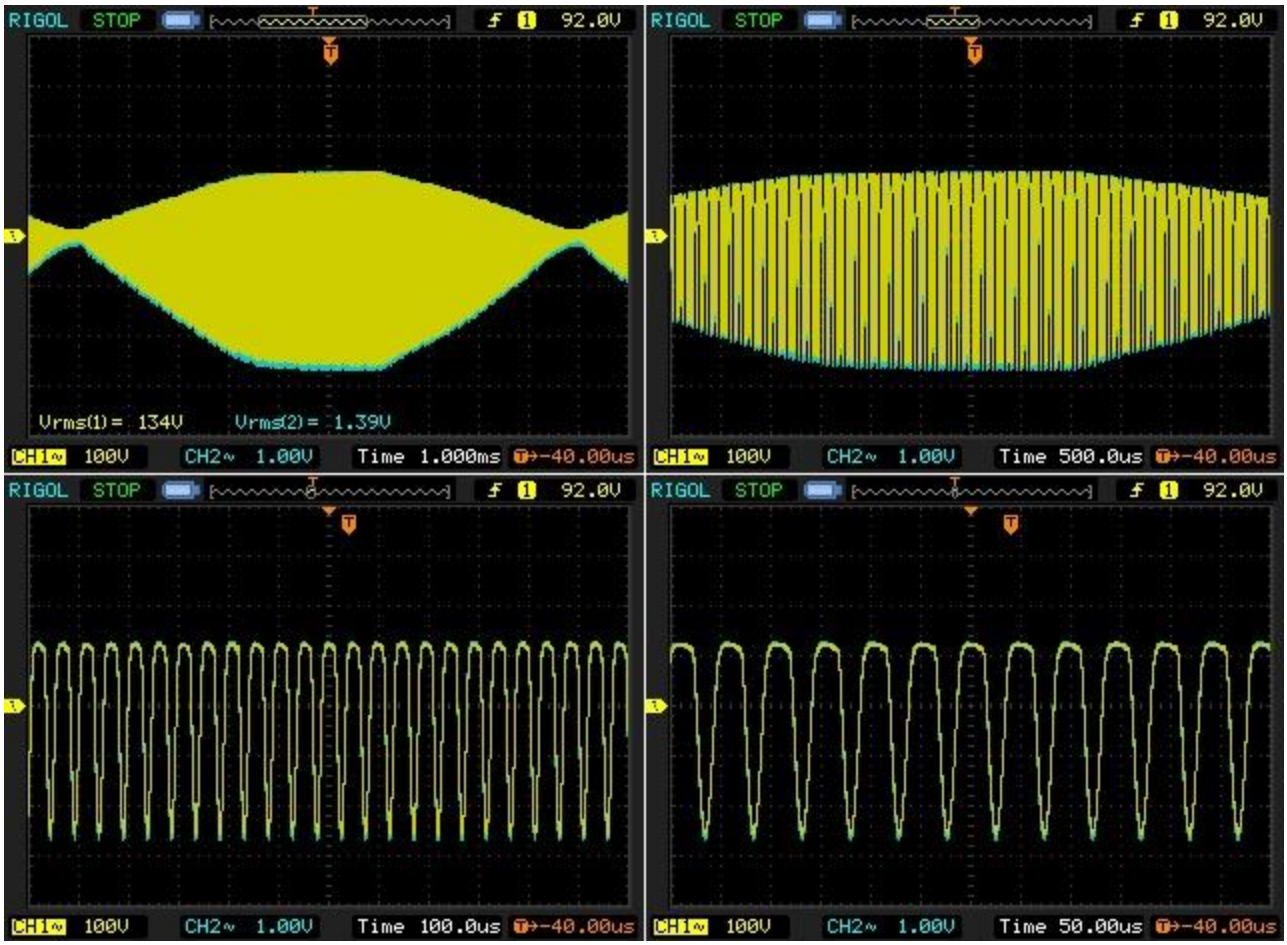
The TOTAL POWER of the LOAD connected at the OUTPUT of the GEGENE is 3550 Watts.

TEST #12 RESULTS:

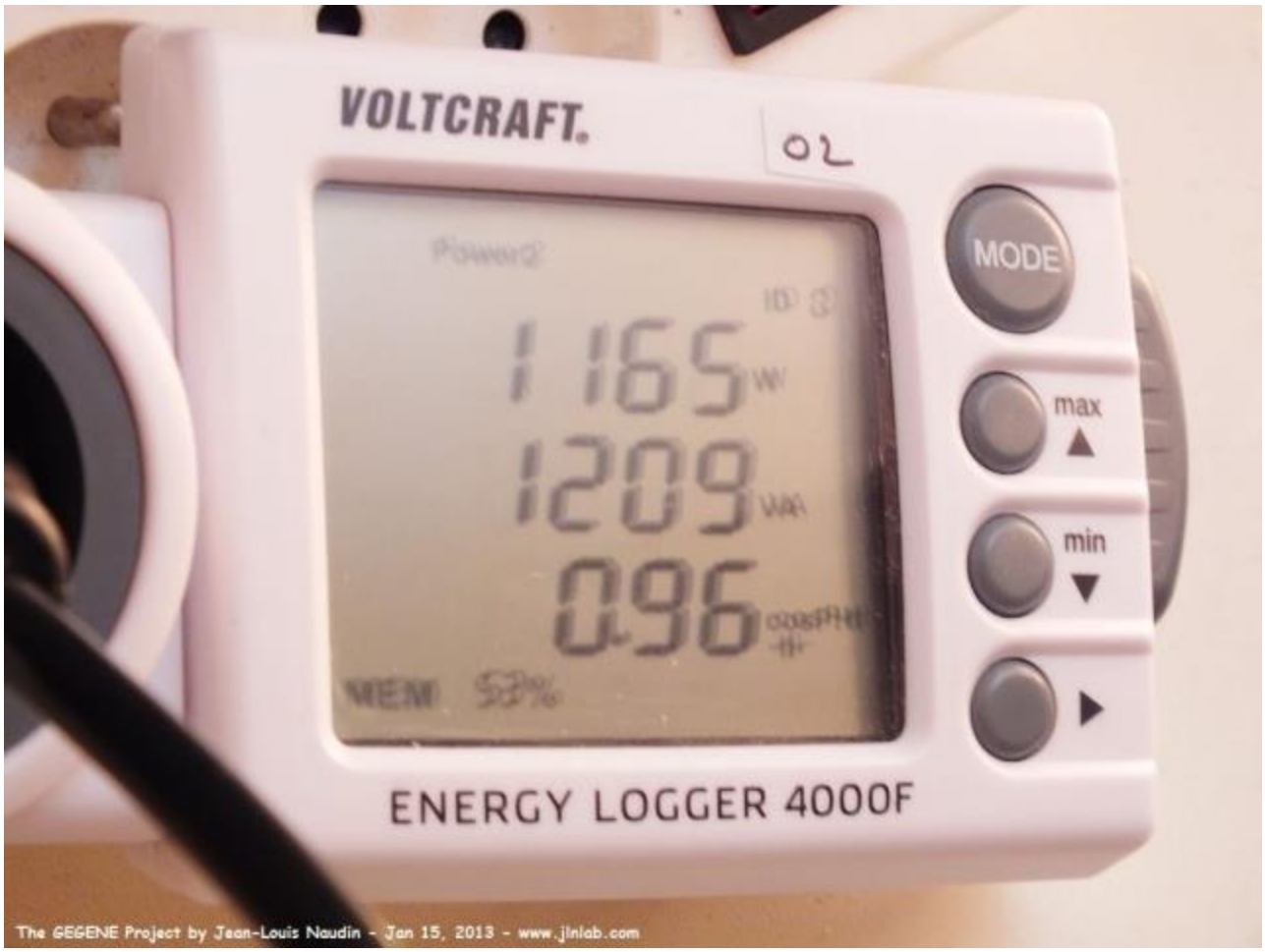
To measure the voltage and the current at the output for powering the halogen lamps, the two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current i.e., the voltage across a 0.1 Ohm non inductive resistor, Mundorf MR10 10W. Then the data is sent to a datasheet to compute true RMS values and the efficiency. The electrical power input of the induction cooker is measured with a Wattmeter, Energy Logger 4000F directly connected on the power grid.



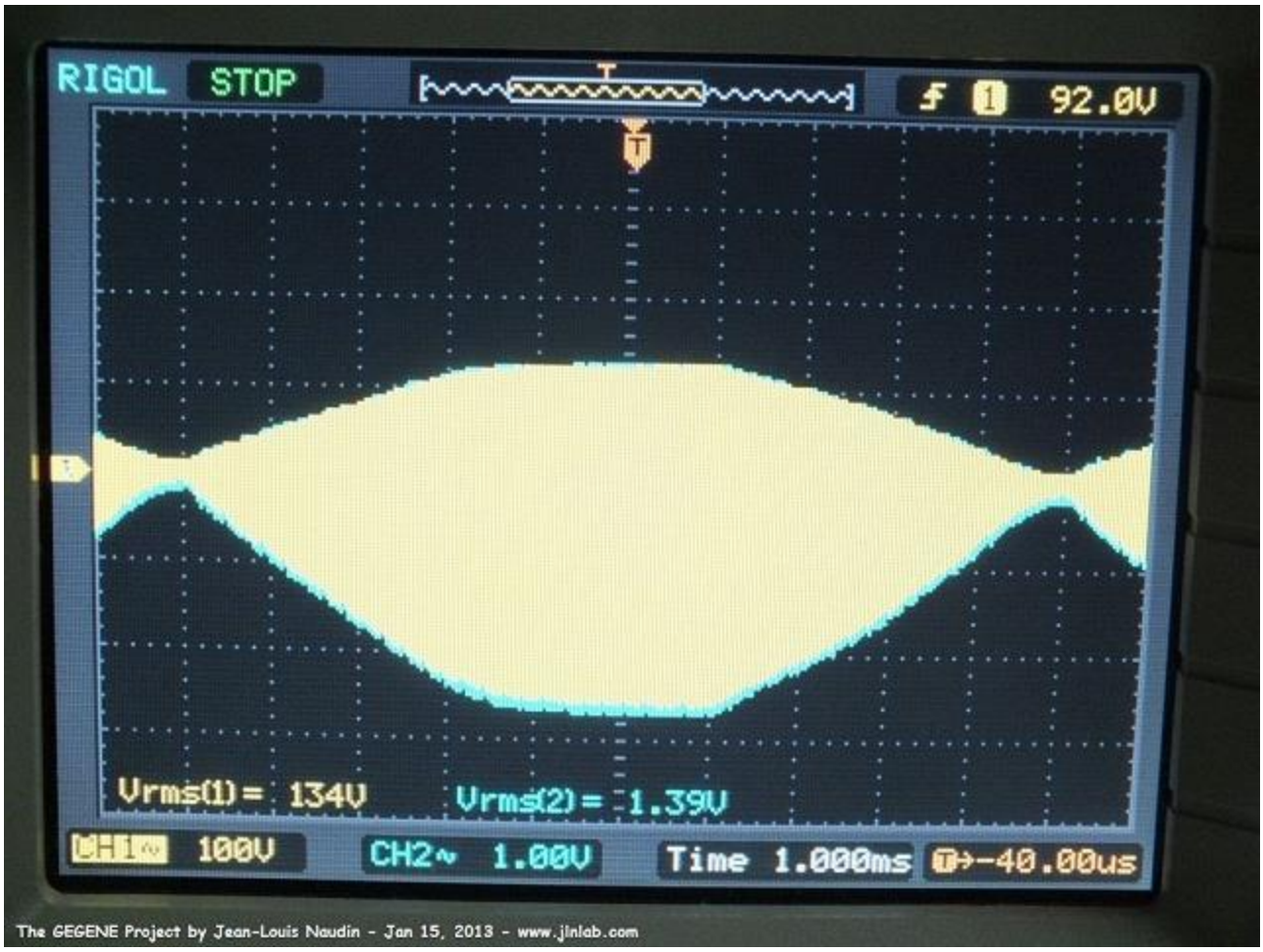
The True RMS values of the voltages on Ch1 and Ch2 are computed in real time by the Rigol digital oscilloscope…



The electrical power for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid:

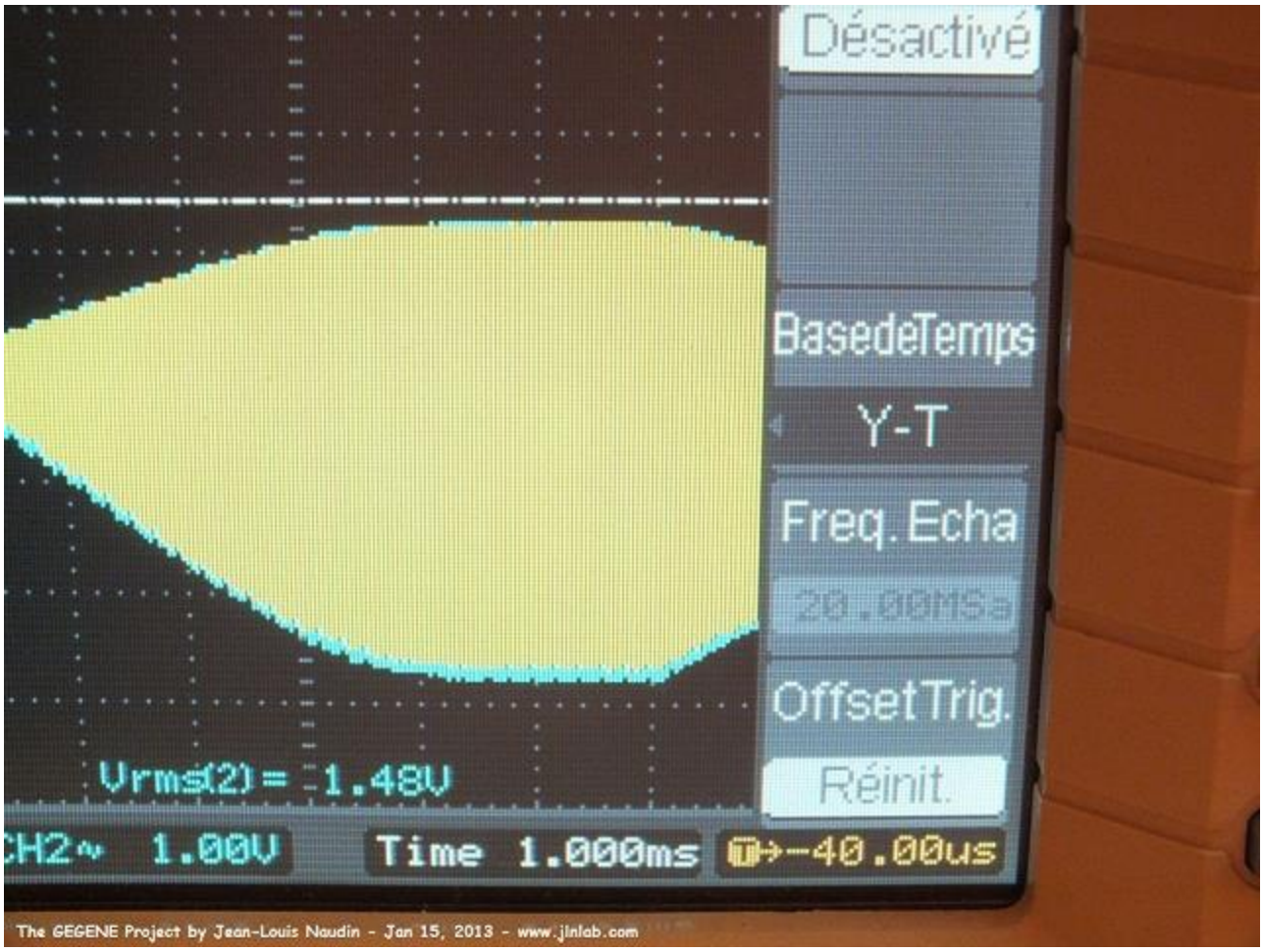


The Wattmeter measures 1165 Watt at the INPUT of the induction cooker.

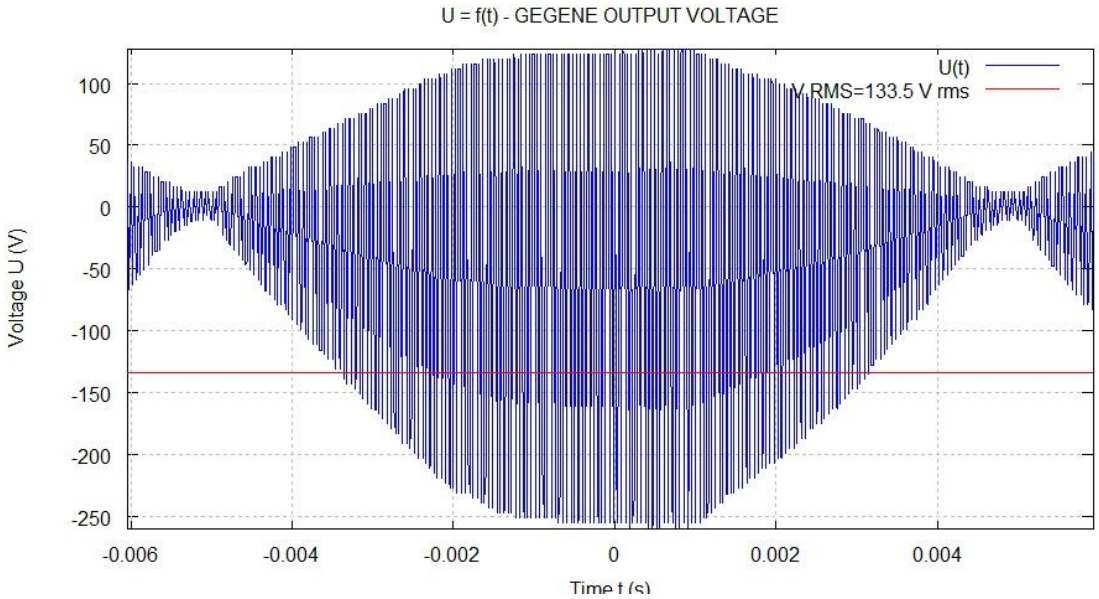


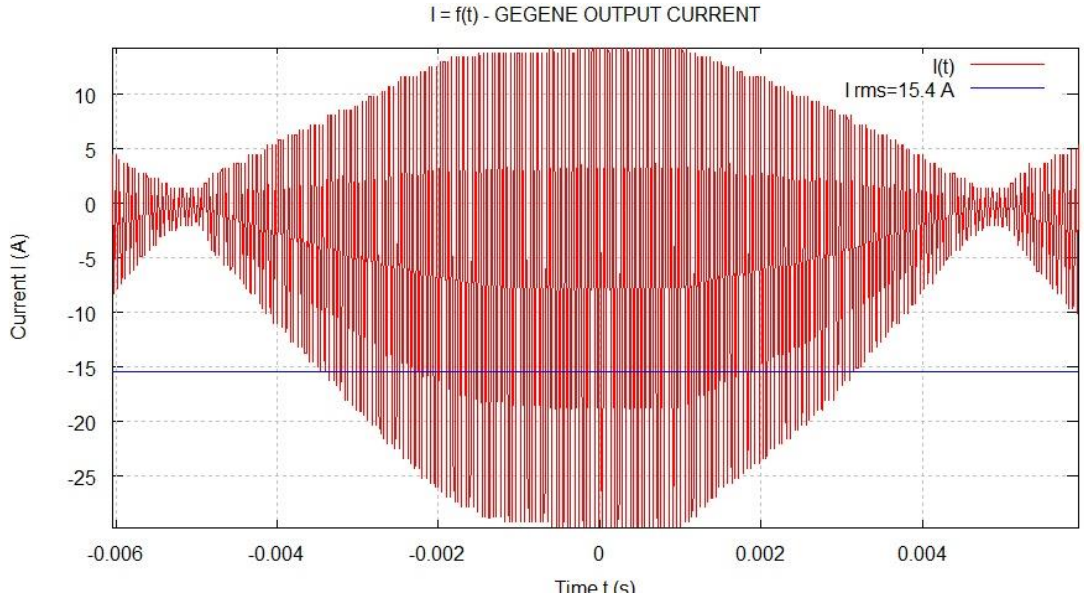
Above the True RMS voltage measured by the Rigol digital oscilloscope.

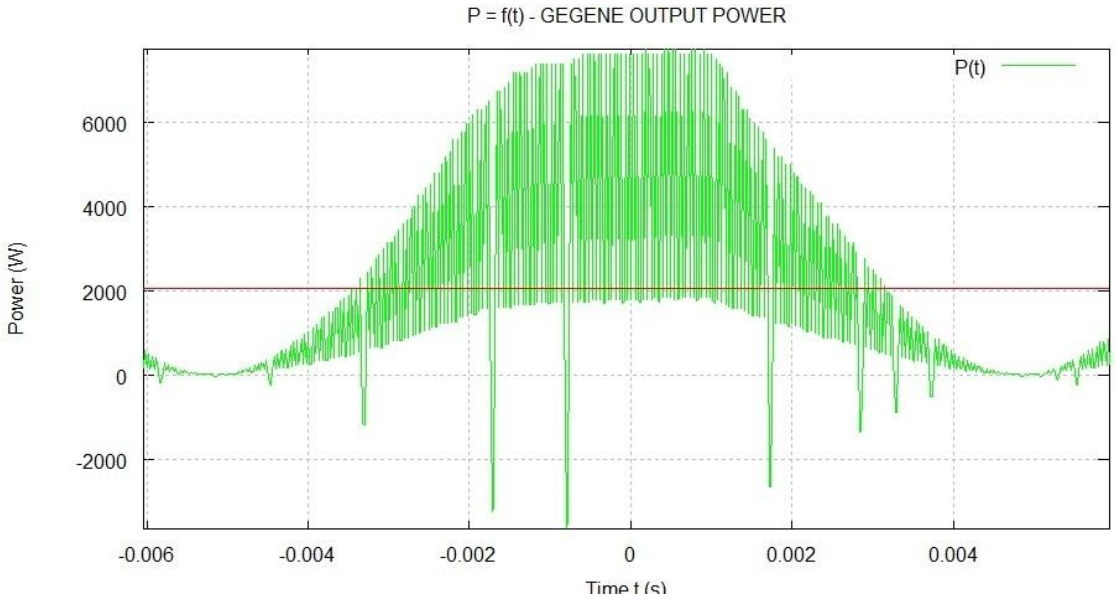
So as to get a good accuracy of the measured values for the mathematical computation, the sampling rate has been set to 20.00 MSa/s.

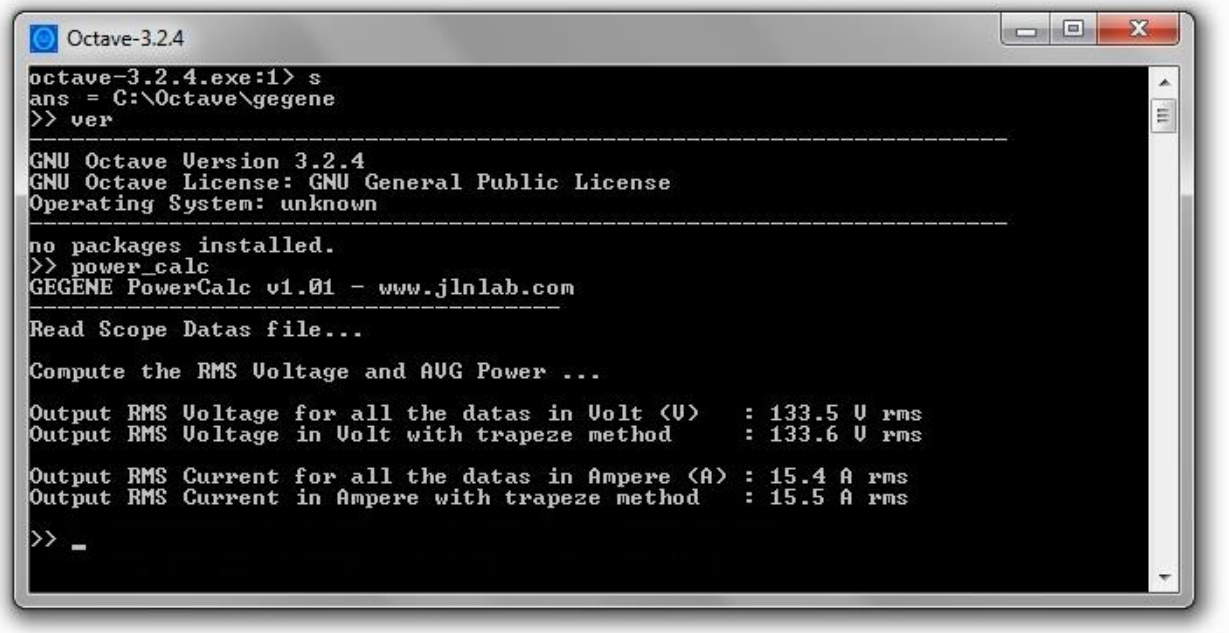


Below, the scope data computed with GNU Octave 3.2.4 (freeware and full compatible version of MATLAB).


U = f(t) - GEGENE OUTPUT VOLTAGE
U(t)
V RMS=133.5 V rms
Voltage U (V)
100
50
0
-50
-100
-150
-200
-250
-0.006
-0.004
-0.002
0
0.002
0.004
Time t (s)


I = f(t) - GEGENE OUTPUT CURRENT
I(t)
I rms=15.4 A
Current I (A)
10
5
0
-5
-10
-15
-20
-25
-0.006
-0.004
-0.002
0
0.002
0.004
Time t (s)





Here is my software source used to compute the data coming from the Rigol digital oscilloscope for Octave 3.2.4 or Matlab R7 or more:

```
% GEGENE Project - RMS Voltage, Current and
Power calculator
% by Jean-Louis Naudin - January 15, 2013
% www.jlnlab.com
%
% This program runs on OCTAVE Version 3.2.4 or
MATHLAB r7.0 or more
% GNU General Public Licence - this is a freeware
%
% v1.01 : add the trapeze method calculation
%
clear all; close all; clc

r=0.09; % Current probe resistance value in Ohm

fprintf('GEGENE PowerCalc v1.01 -
www.jlnlab.com\n');
fprintf('--------------------------------------\nRead Scope
Datas file...\n\n');

datas = dlmread('NewFile0.csv', ',',2,0); % read the
datas scope file
% Below a sample of the CSV datas from the Rigol
digital oscilloscope
% X,CH1,CH2,
% Second,Volt,Volt,
% -3.72e-03,8.40e+01,7.60e-01,
% -3.70e-03,-3.20e+01,-3.60e-01,
% -3.68e-03,-2.80e+01,-2.80e-01,

l=length(datas); % numbers of sample
t=datas(1:l,1); % t: time base
u1=datas(1:l,2); % ch1: voltage output
u2=datas(1:l,3); % ch2: voltage accros the current
probe

%
% compute the RMS Voltage
%
fprintf('Compute the RMS Voltage and AVG Power
...\n\n');
%VTG_rms=norm(u1)/sqrt(length(u1));
VTG_rms = sqrt(sum(u1.*conj(u1))/size(u1,1));
veff=sqrt(trapz(t,u1.*u1)/(t(l)-t(1)));
vrms = zeros(l,1);
vrms = vrms + VTG_rms;
figure(1); clf;
plot(t,u1,'-b',t,vrms,'-r',t,-vrms,'-r');
xlabel('Time t (s)');
ylabel('Voltage U (V)');
title('U = f(t) - GEGENE OUTPUT VOLTAGE');
axis([t(1) t(l) min(u1) max(u1)]);
disp(['Output RMS Voltage for all the datas in Volt
(V) : ',sprintf('%0.1f',VTG_rms),' V rms']);
```

```
disp(['Output RMS Voltage in Volt with trapeze
method : ',sprintf('%0.1f',veff),' V rms']);
grid on
legend('U(t)',['V RMS=',sprintf('%0.1f',VTG_rms),'
V rms']);

%
% compute the RMS Current
%
ip2=u2/r;
%CUR_rms=norm(u2/r)/sqrt(length(u2));
CUR_rms =
sqrt(sum(u2/r.*conj(u2/r))/size(u2/r,1));
ceff=sqrt(trapz(t,ip2.*ip2)/(t(l)-t(1)));
crms = zeros(l,1);
crms = crms + CUR_rms;
figure(2); clf;
plot(t,ip2,'-r',t,crms,'-b',t,-crms,'-b');
xlabel('Time t (s)');
ylabel('Current I (A)');
title('I = f(t) - GEGENE OUTPUT CURRENT');
axis([t(1) t(l) min(ip2) max(ip2)]);
disp(['Output RMS Current for all the datas in
Ampere (A) : ',sprintf('%0.1f',CUR_rms),' A rms']);
disp(['Output RMS Current in Ampere with trapeze
method : ',sprintf('%0.1f',ceff),' A rms']);
grid on
legend('I(t)',['I rms=',sprintf('%0.1f',CUR_rms),' A']);

%
% compute the Average Power
%
pp=u1.*u2/r;
Pavg = VTG_rms * CUR_rms;
pmoy=trapz(t,pp)/(t(l)-t(1));
pwravg = zeros(l,1);
pwravg = pwravg + Pavg;
figure(3); clf;
plot(t,pp,'-g',t,pwravg,'-r');
xlabel('Time t (s)');
ylabel('Power (W)');
title('P = f(t) - GEGENE OUTPUT POWER');
axis([t(1) t(l) min(pp) max(pp)]);
disp(['---> OUTPUT AVG Power (VTG_rms *
CUR_rms): ',sprintf('%0.1f',Pavg),' Watt ']);
disp(['---> OUTPUT AVG Power (Trapeze method)
: ',sprintf('%0.1f',pmoy),' Watts']);
grid on
legend('U(t)',['AVG PWR =',sprintf('%0.1f',Pavg),'
W ']);
```

You may download my full PowerCalc v1.01 software with the scope data used in this test, HERE.

Under Octave, launch power_calc.

NEXT TEST:

TEST #13 : A New successful experiment done by WOOPY on the GEGENE

TEST #13: A New Successful Test Done by WOOPY on the GEGENE

January 16, 2013 - TEST #13: Here is a new successful test done by WOOPY on the GEGENE with his new Unold induction cooker.

Thanks to WOOPY for the sharing of his experiments on the GEGENE.

Here is the WOOPY's tests video

NEXT TEST:

TEST #14 : Full tests and measurements with the GEGENE v1.3

TEST #14: Full Tests and Measurements with the GEGENE v1.3

January 16, 2013 - TEST #14: Here is a new series of tests of the GEGENE v1.3 with the flat bifilar coil v1.1 and the induction cooker manufactured by "Rosenstein & Söhne" and with the reference NC-3050.

In this test, I have used this setup below of halogen lamps as loads:

- 1 box of 6 halogen lamps of 105 W
- 2 sets of halogen which contains:
  - 1 set of halogen tubes: ((2 x 240 W) + (1 x 400 W)) + (2 x 500 W)
  - 1 set of halogen tubes: (1 x 240 W) + (2 x 400 W)

The TOTAL POWER of the LOAD connected at the OUTPUT of the GEGENE is 3550 Watts.

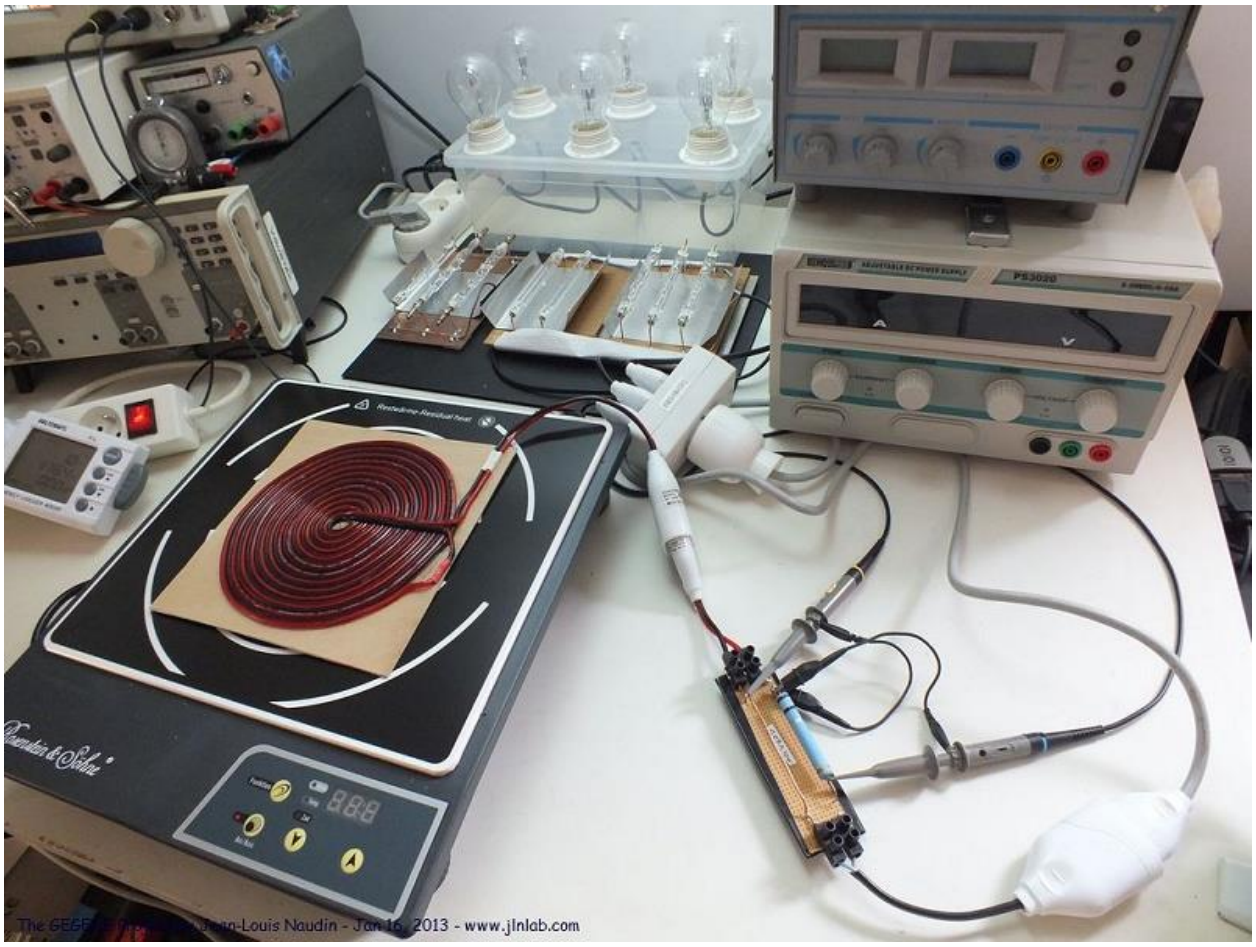

The OUTPUT LOADS :
1 box of 6 halogenes lamps of 105 W
1 set of halogens tubes : ((2 x 240 W) + (1 x 400 W)) + (2 x 500 W)
1 set of halogens tubes : (1 x 240 W) + (2 x 400 W)
The GEGENE Project by Jean-Louis Naudin - Jan 16, 2013 - www.jlnlab.com

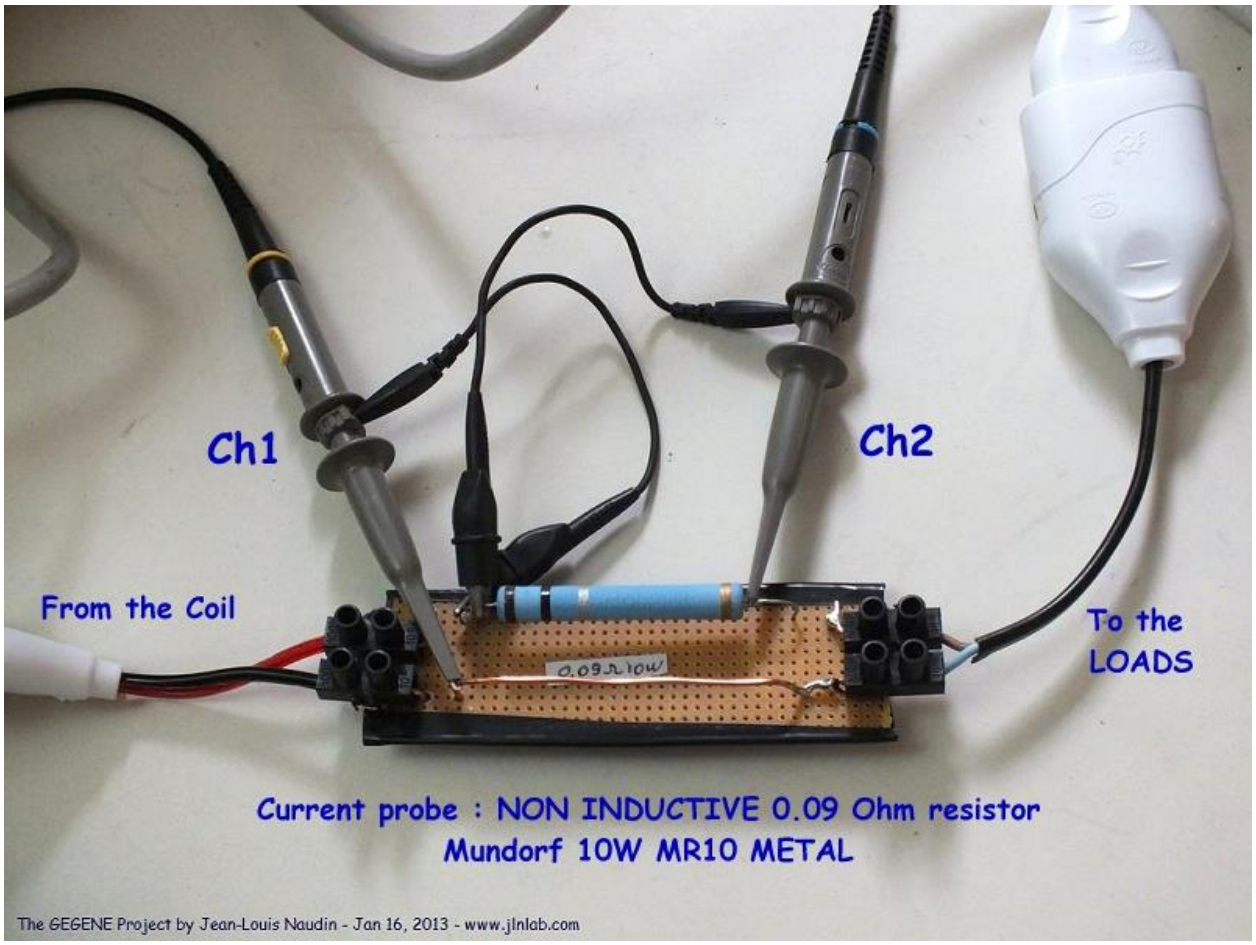
In this test, the output power has been limited to the level 5/10, i.e., at the middle power (about 1200 W).

TEST #12 RESULTS:

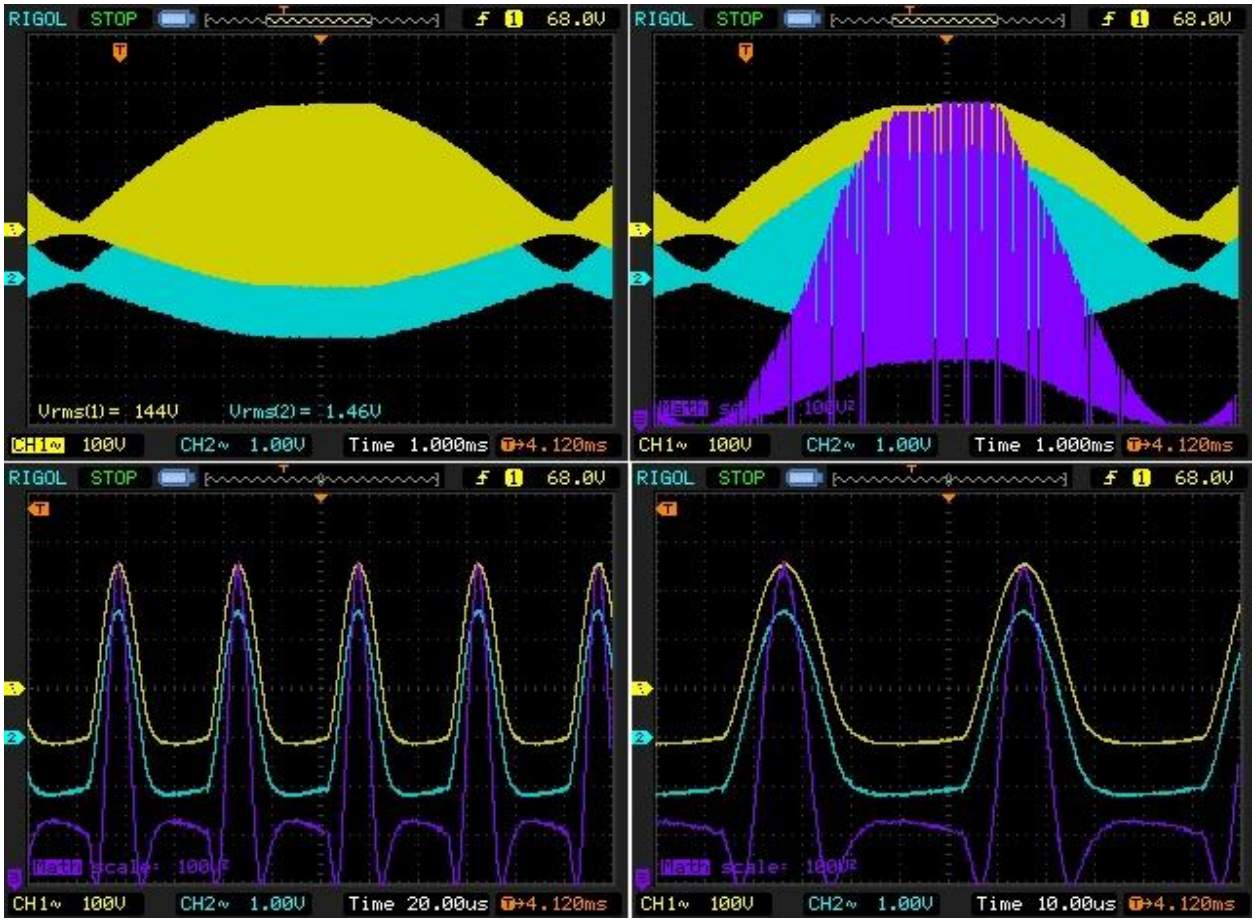
To measure the voltage and the current at the output for powering the halogen lamps, the two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current, i.e., the voltage across a 0.1 Ohm non inductive resistor, Mundorf MR10 10W. Then the data is sent to a datasheet to compute true RMS values and the efficiency. The electrical power input

of the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid.

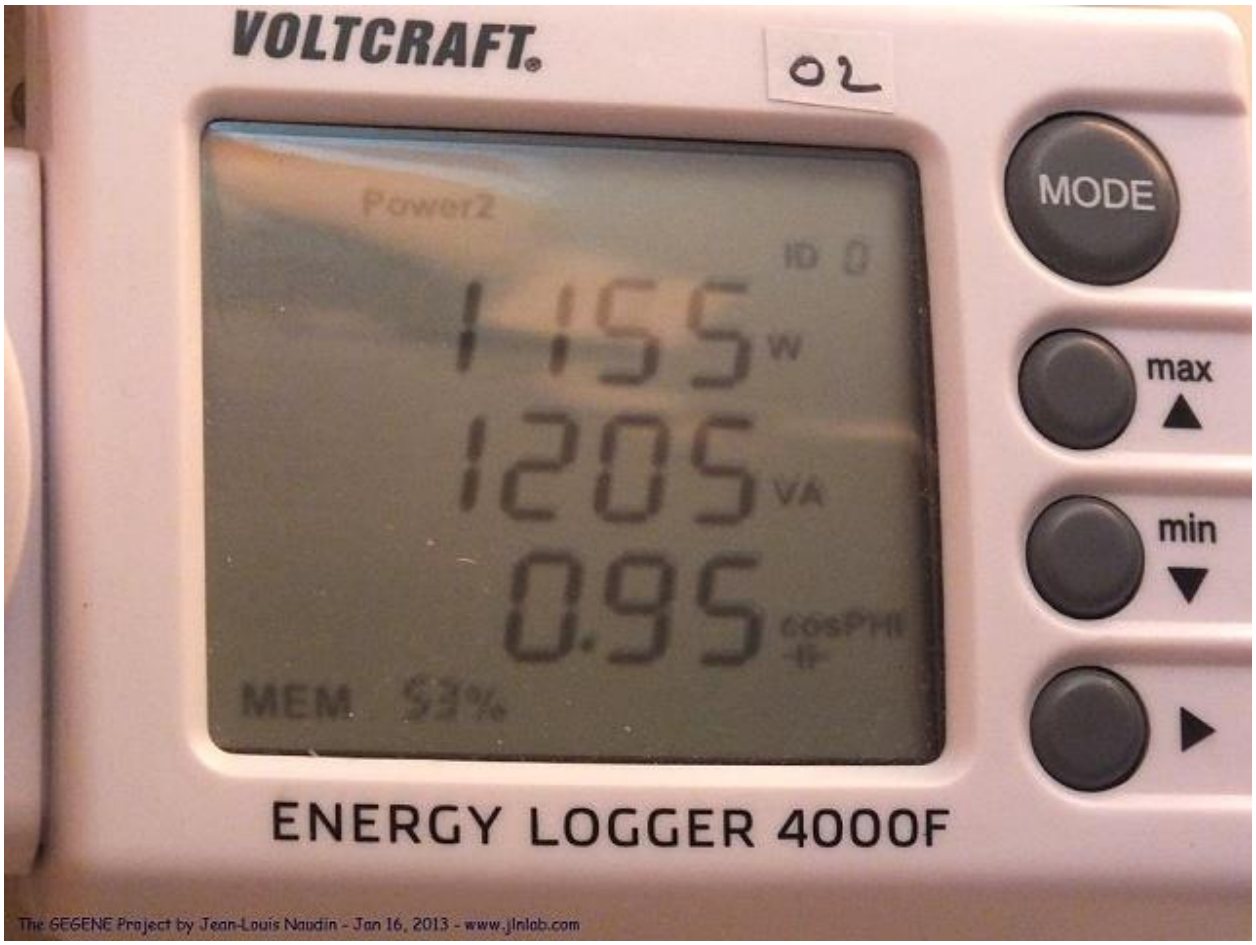




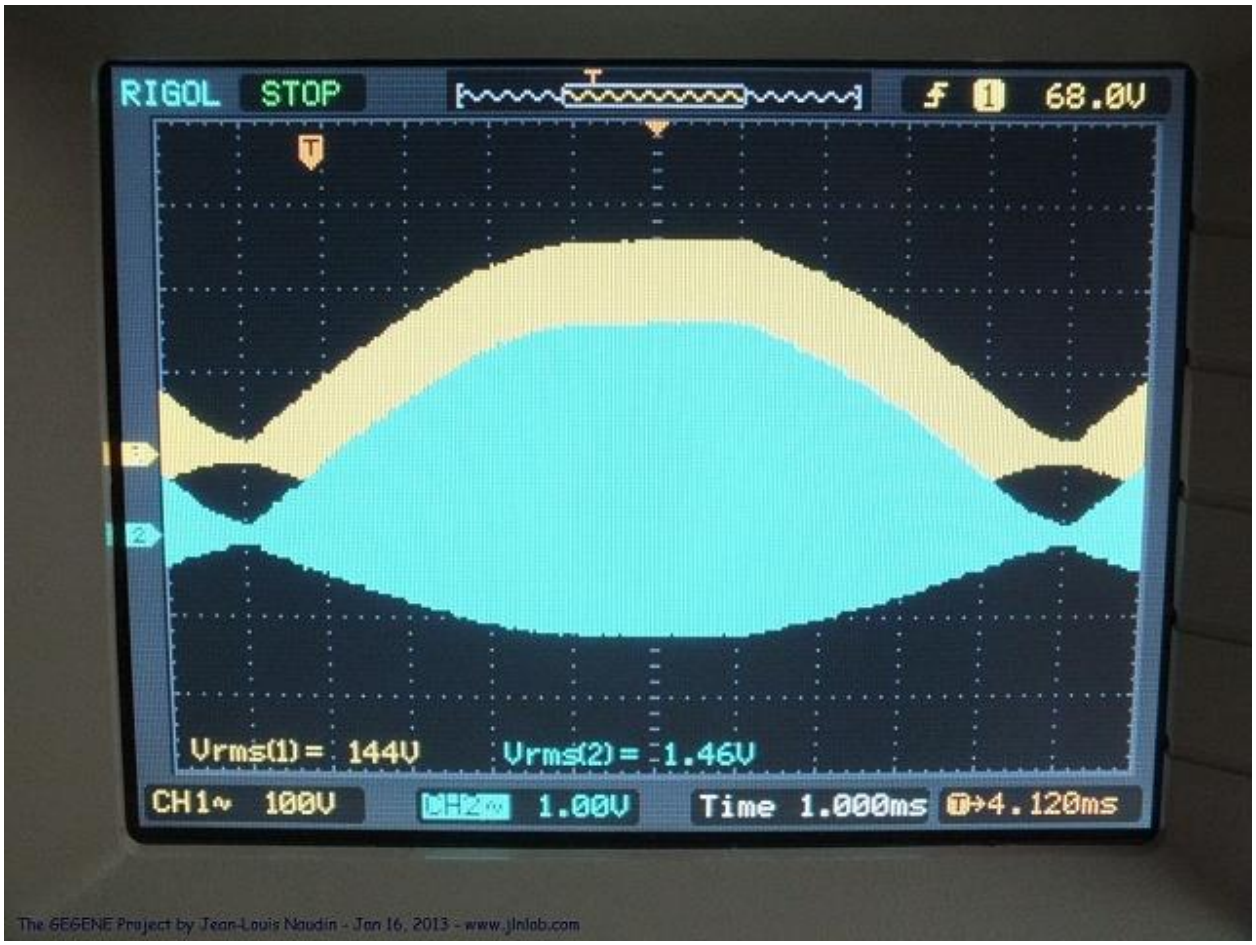
The True RMS values of the voltages on Ch1 and Ch2 are computed in real time by the Rigol digital oscilloscope.



The electrical power for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid:



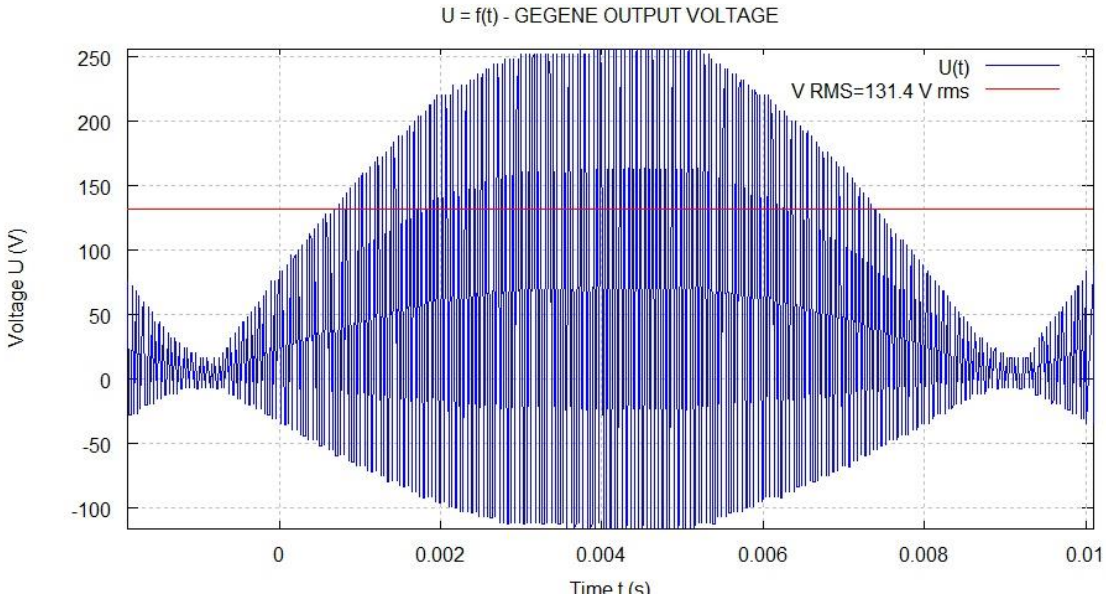
The Wattmeter measures 1155 Watts at the INPUT of the induction cooker.

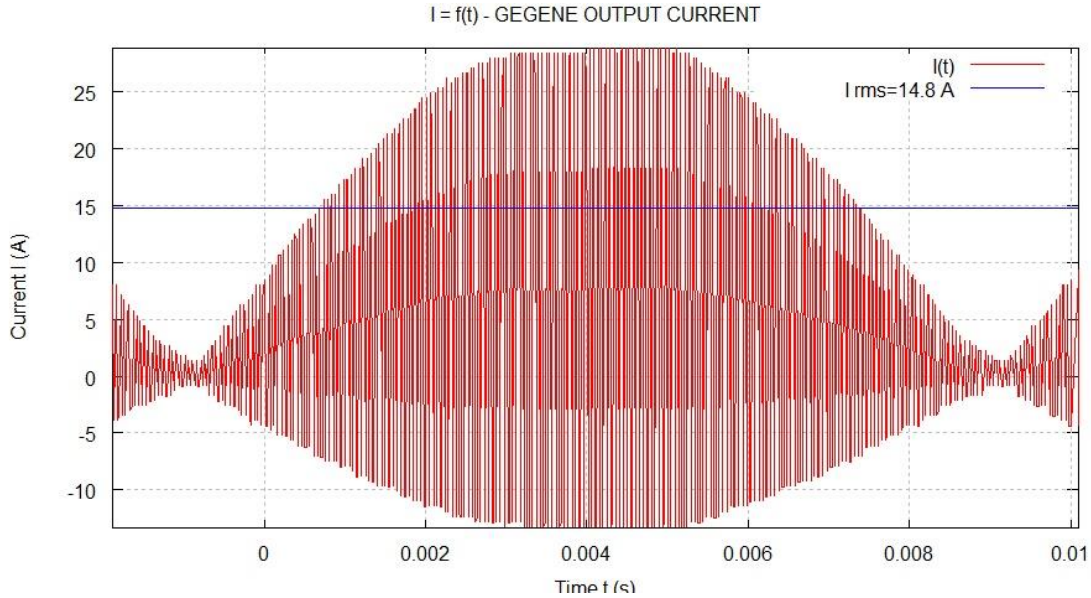

RIGOL
STOP
68.0V
Vrms(1)= 144V
Vrms(2)= 1.46V
CH1∿ 100V
1.00V
Time 1.000ms
4.120ms
The 6E6ENE Project by Jean-Louis Naudin - Jan 16, 2013 - www.jlnlab.com

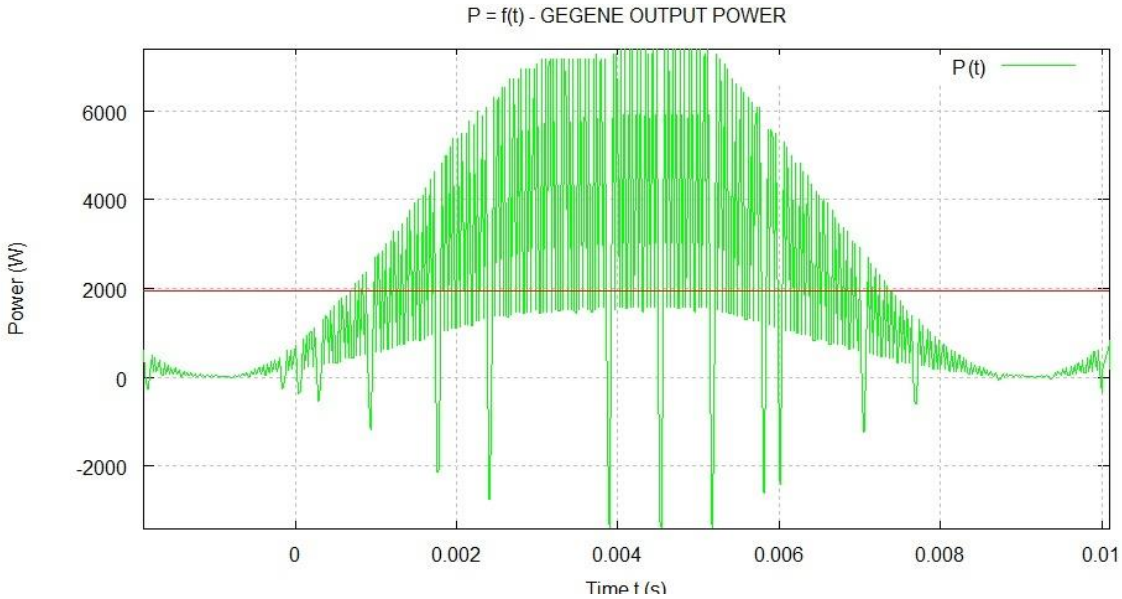
Above the True RMS voltage measured by the Rigol digital oscilloscope.

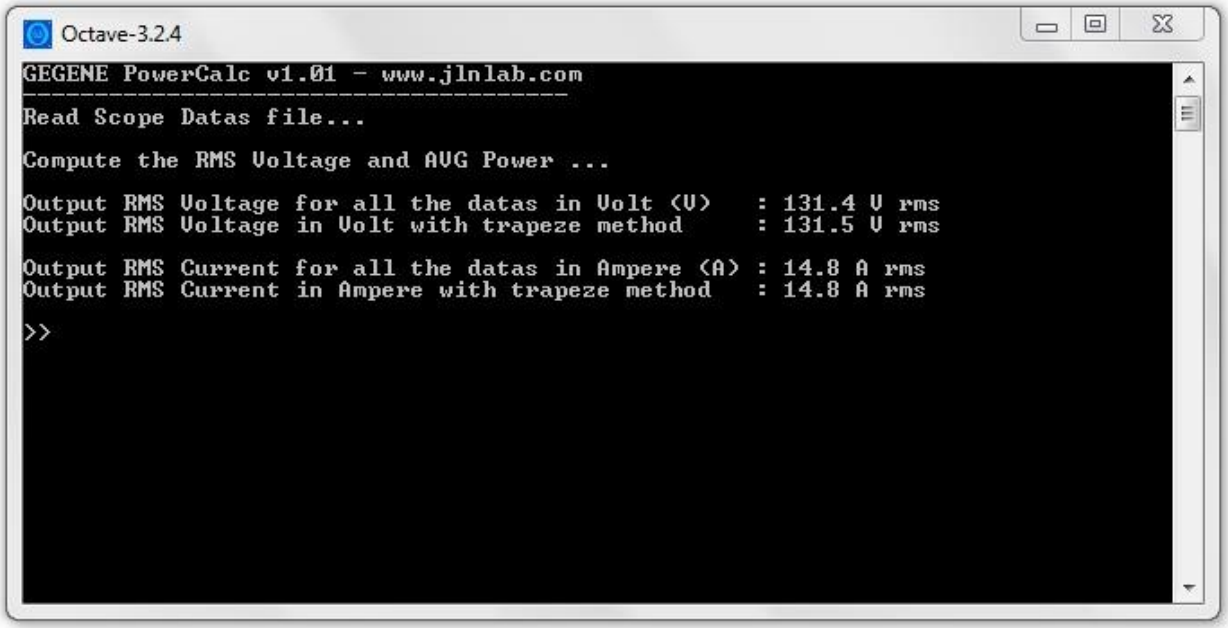
So as to get a good accuracy of the measured values for the mathematical computation, the sampling rate has been set to 20.00 MSa/s.

Below, the scope data is computed with GNU Octave 3.2.4 (freeware and fully compatible version of MATLAB):


U = f(t) - GEGENE OUTPUT VOLTAGE
U(t)
V RMS=131.4 V rms
Voltage U (V)
250
200
150
100
50
0
-50
-100
0
0.002
0.004
0.006
0.008
0.01
Time t (s)


I = f(t) - GEGENE OUTPUT CURRENT
I(t)
I rms=14.8 A
Current I (A)
25
20
15
10
5
0
-5
-10
0
0.002
0.004
0.006
0.008
0.01
Time t (s)





You may download my full PowerCalc v1.01 software with the scope data used in this test, HERE.

Under Octave launch power_calc.

Here is the full video of the TEST #14.

NEXT TEST:

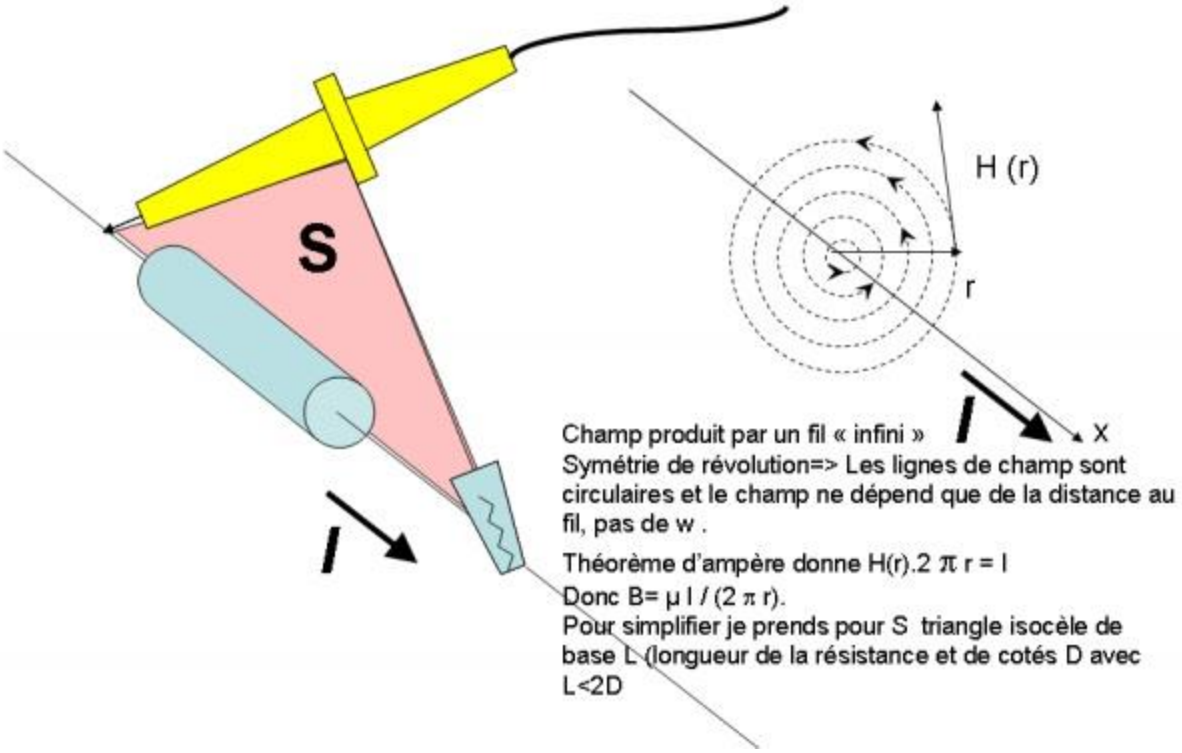
TEST #15 : Additional measurements with the GEGENE v1.3

TEST #15: Additional Measurements with the GEGENE v1.3

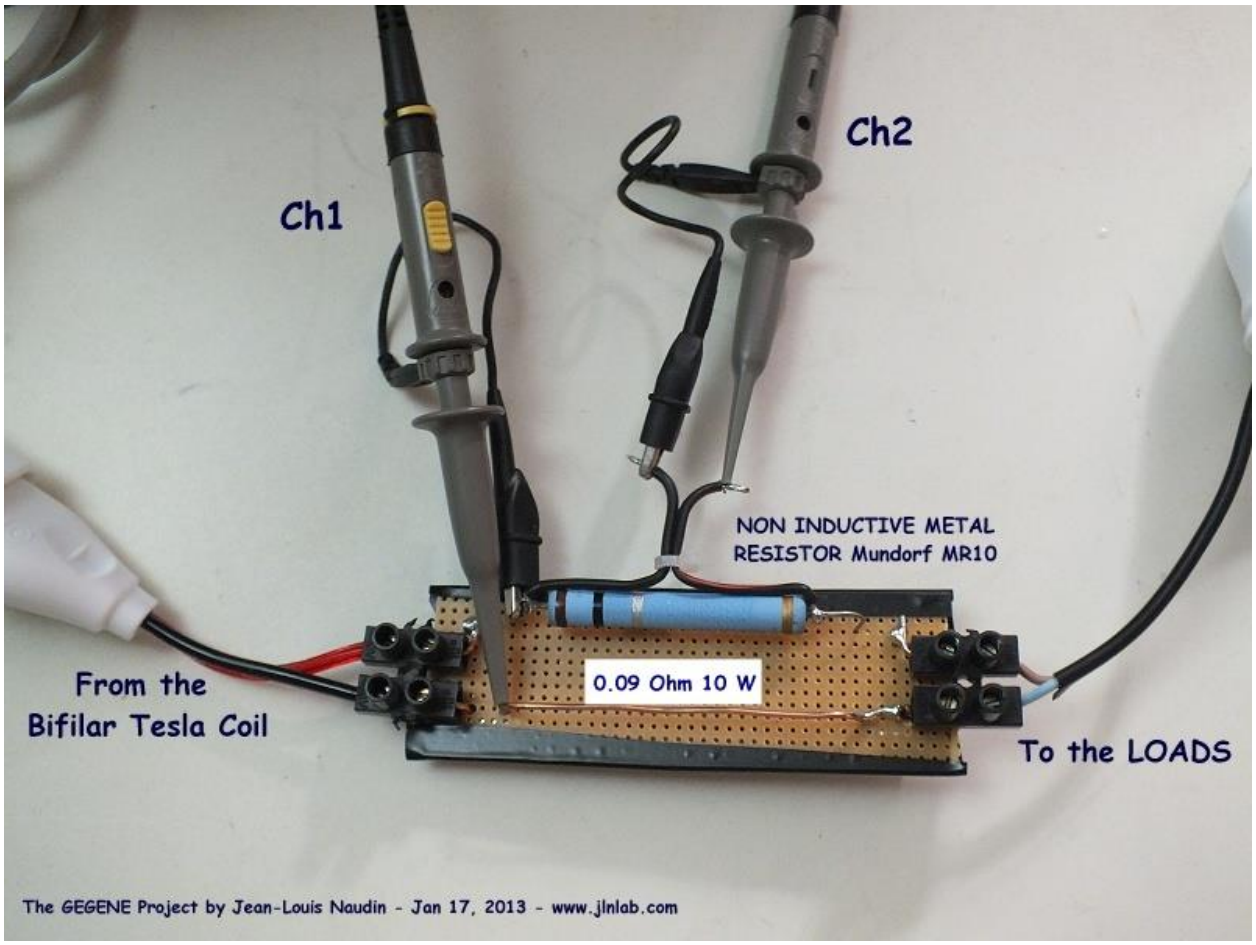
January 17, 2013 - TEST #15: Here is a new series of additional measurements to the TEST#14 on the GEGENE v1.3. The purpose of this test is to improve the accuracy of the current measurements via the non-inductive 0.1 Ohm resistance (Mundorf MR10 10W) by removing all potential risks which may interfere with the measurement.

In the previous configuration used in the TEST#14, the Ch2 probe of the oscilloscope is connected across the 0.1 Ohm resistor. The length of this resistor is 50 mm, so there is a possibility that the voltage measurement can be jammed by the magnetic field flowing around this resistor. This magnetic field around the resistance may eventually induce an additional parasitic voltage which can trouble the measurement. Below, a diagram which shows the effect of the magnetic field surrounding the resistance on the measurement loop of the Ch2 probe. Thanks to ***zgreudz*** for his relevant remark about this:

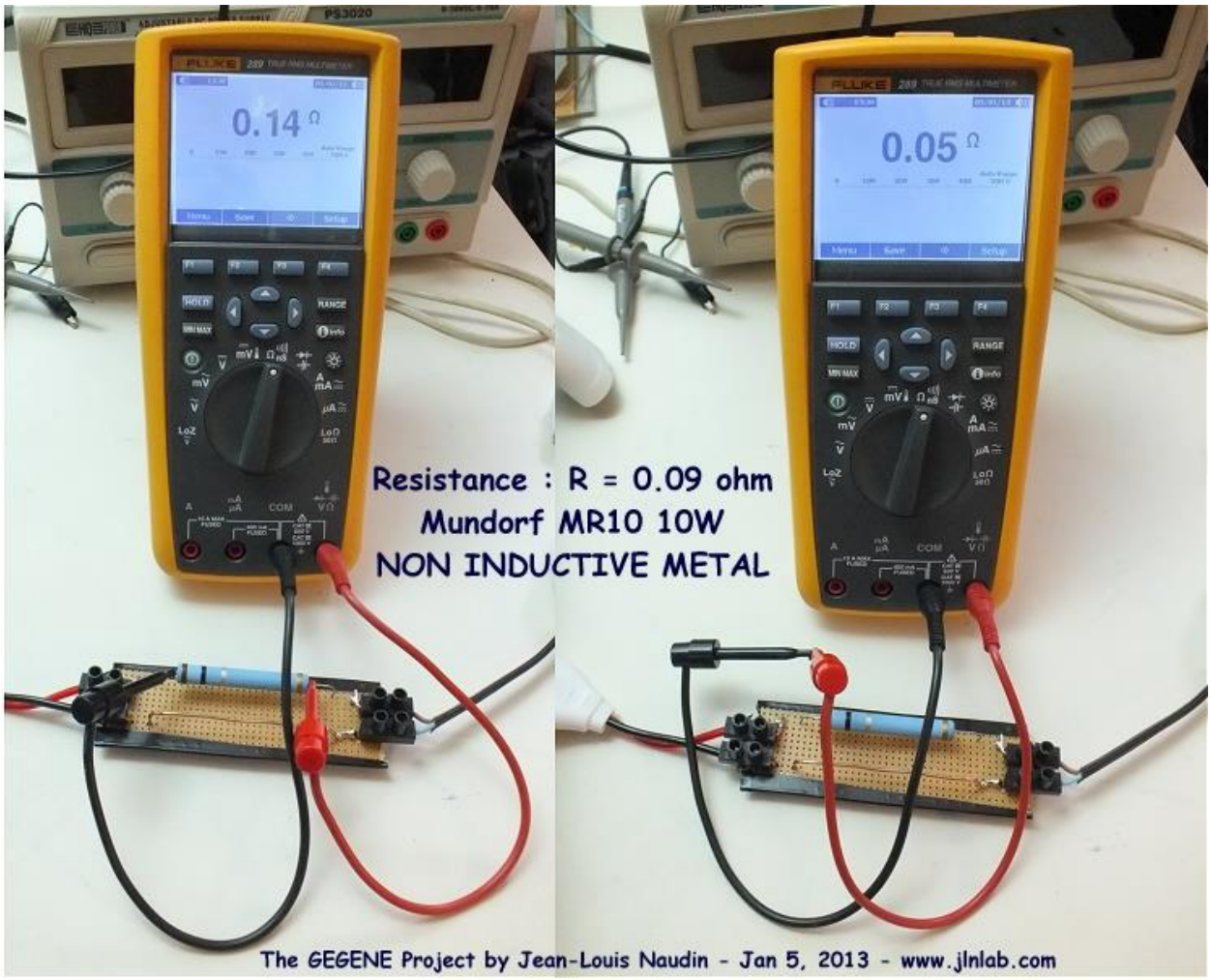
Tension induite dans le triangle maudit



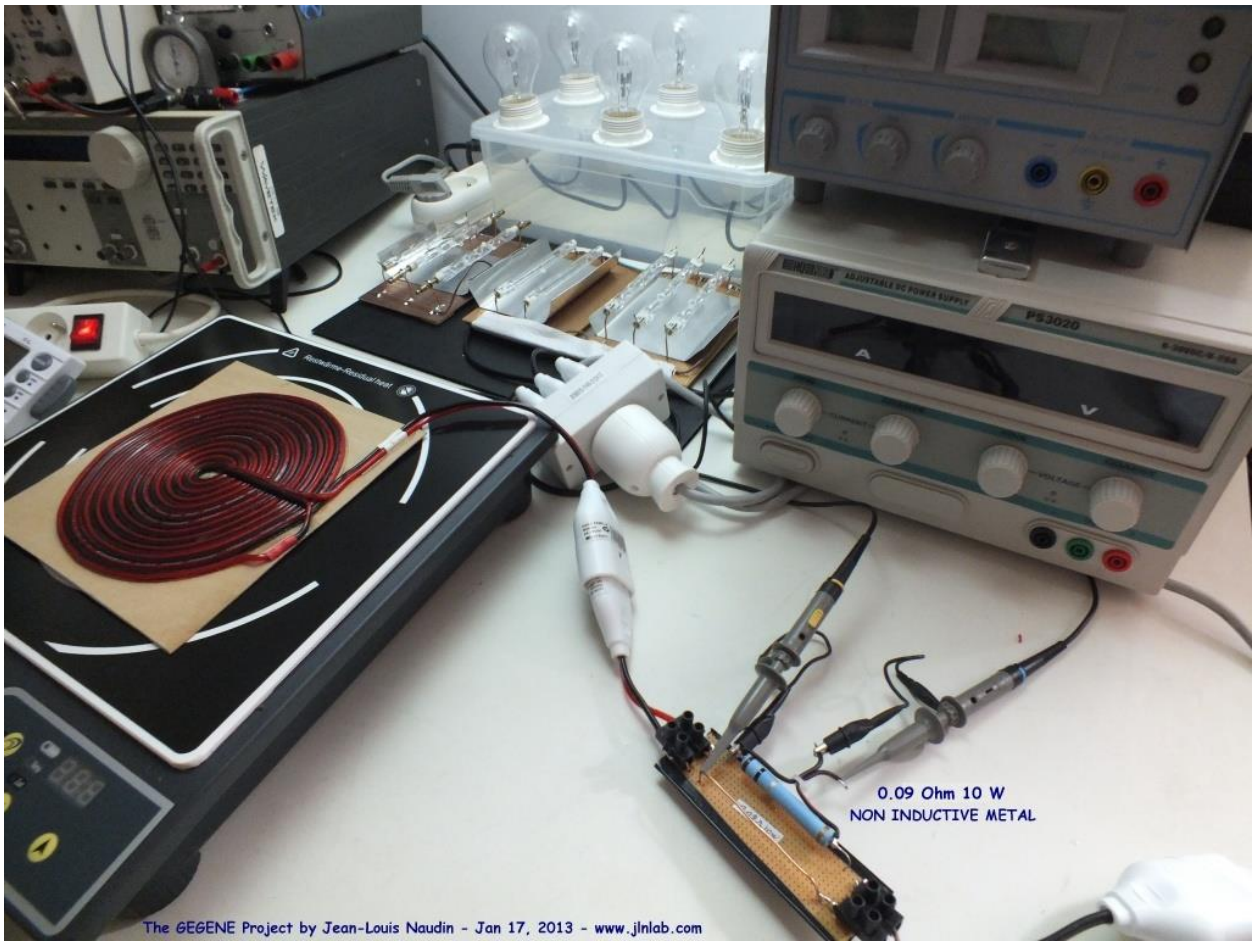
To check if the presence of the triangular loop (the pink surface) is able to create trouble in the current measurement, I have built a new setup for the measurement of the current so as to reduce this surface near to zero and thus to nullify the electromagnetic interference produced by the magnetic field surrounding the resistance. Here is this new setup:



In this setup, the influence of the magnetic field surrounding the resistance is negligible.



The exact value of the resistance is 0.09 Ohm.



Here are the new tests results on the TEST#15:

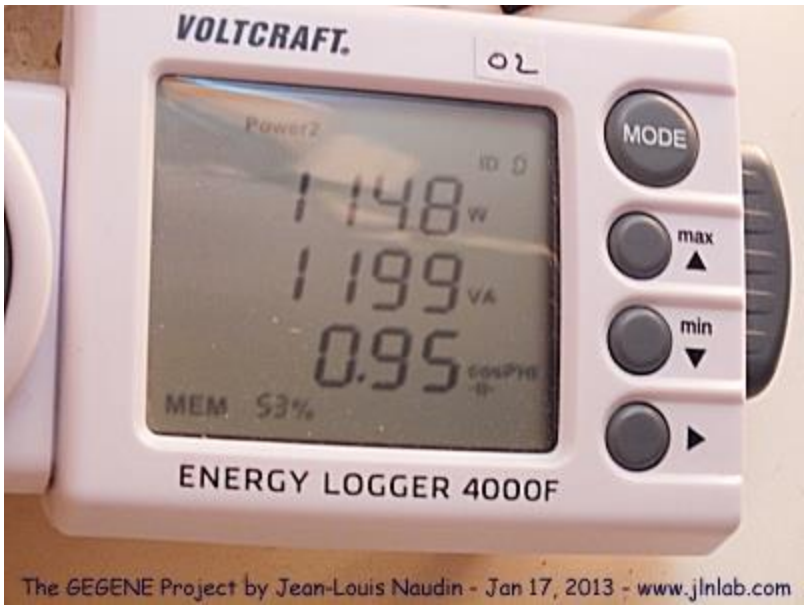
I have used the same loads at the GEGENE v1.3 output as in the TEST#14 for a total of **3550 W of halogen lamps**.

In this test, the output power has been limited to the level 5/10, i.e., at the middle power (about 1200 W).

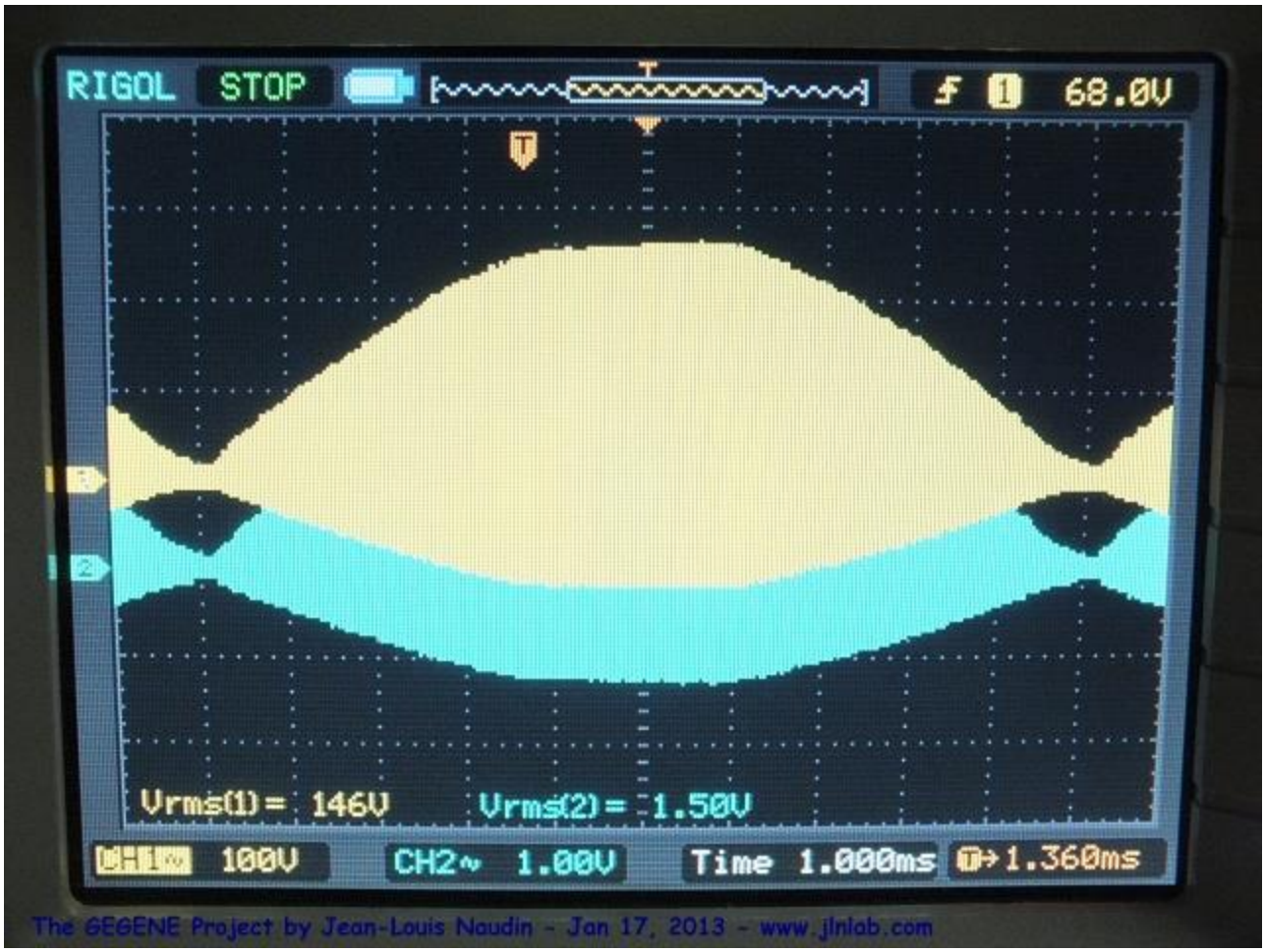
To measure the voltage and the current at the output for powering the halogen lamps, the two scope probes are set to X10 and are connected to the flat bifilar coil output. The probe Ch1 is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current, i.e., the voltage across a 0.1 Ohm non inductive resistor, Mundorf MR10 10W. Then the data are sent to a datasheet to compute true RMS values and the efficiency. The electrical power input

of the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid.

The electrical power for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid:

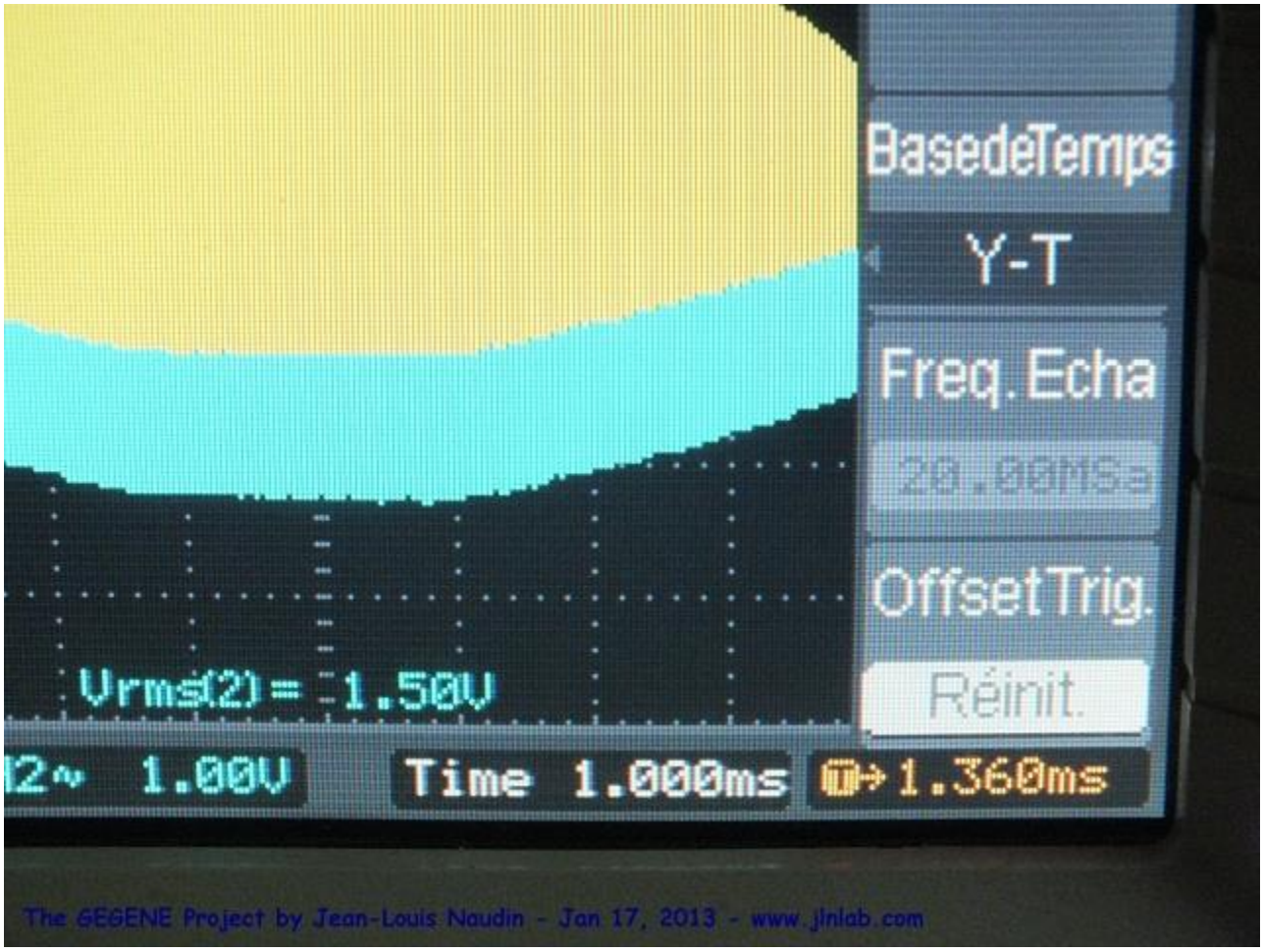


The Wattmeter measures 1148 Watts at the INPUT of the induction cooker.



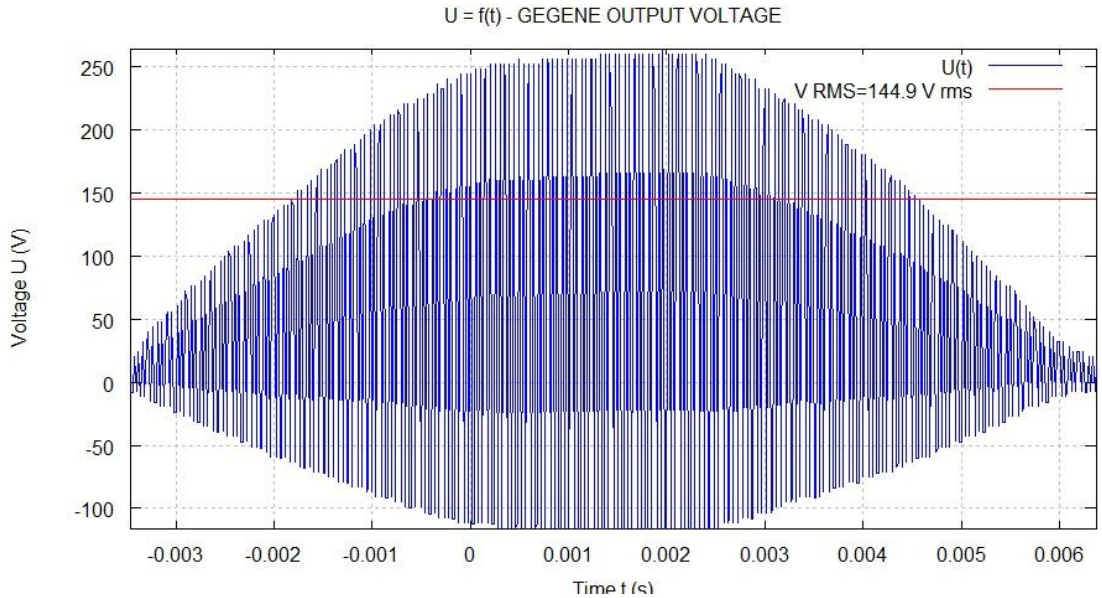
Above, the True RMS voltage measured by the Rigol digital oscilloscope.

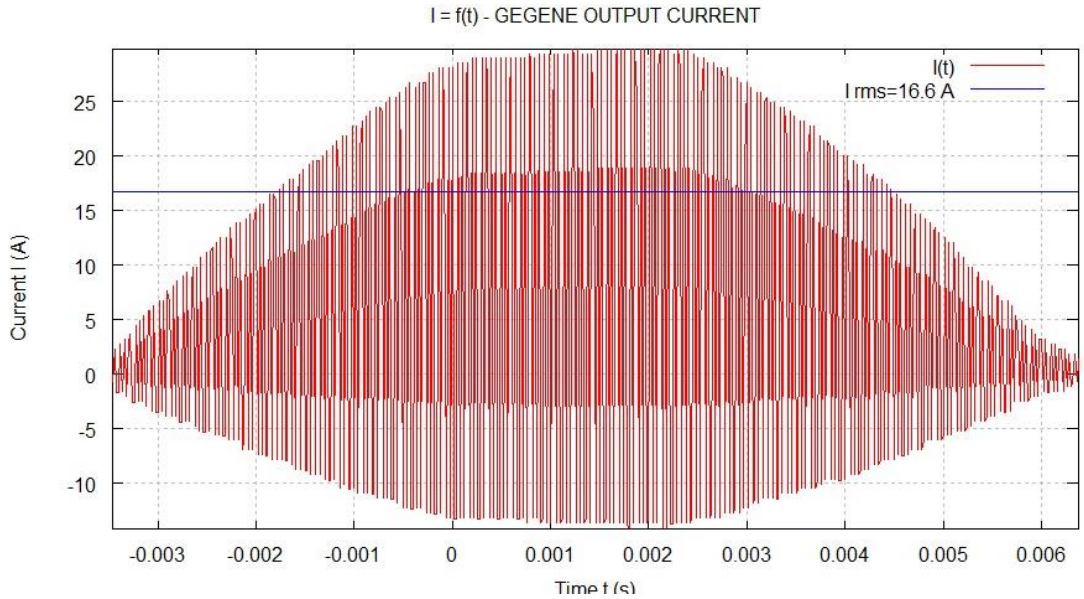
So as to get a good accuracy of the measured values for the mathematical computation, the sampling rate has been set to 20.00 MSa/s.



We can observe that there is no phase shift between the voltage and the current measured.

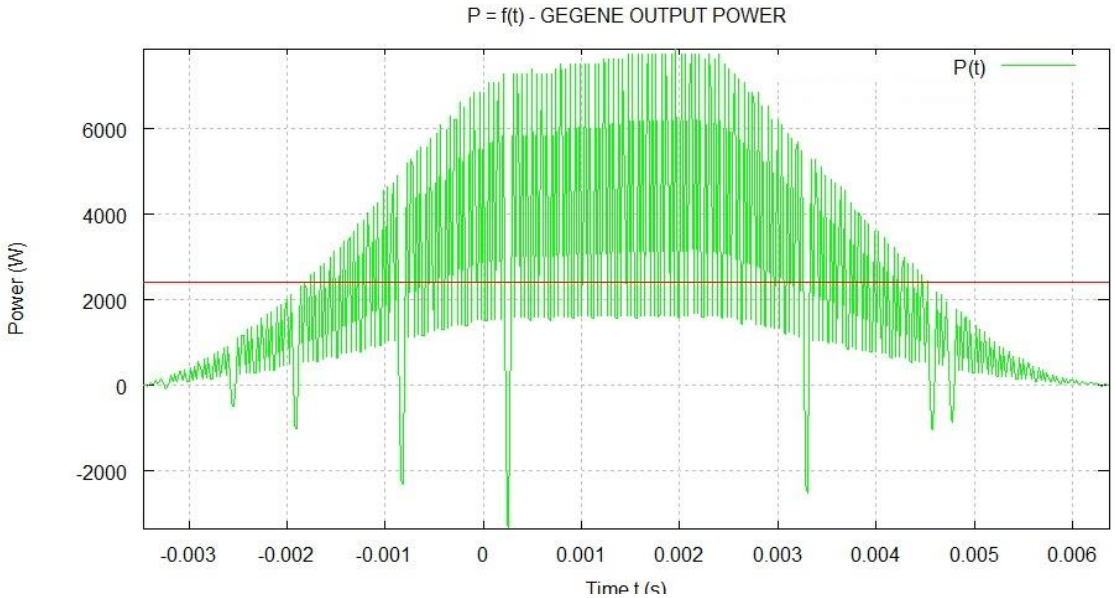
Below, the scope data computed with GNU Octave 3.2.4 (freeware and full compatible version of MATLAB).

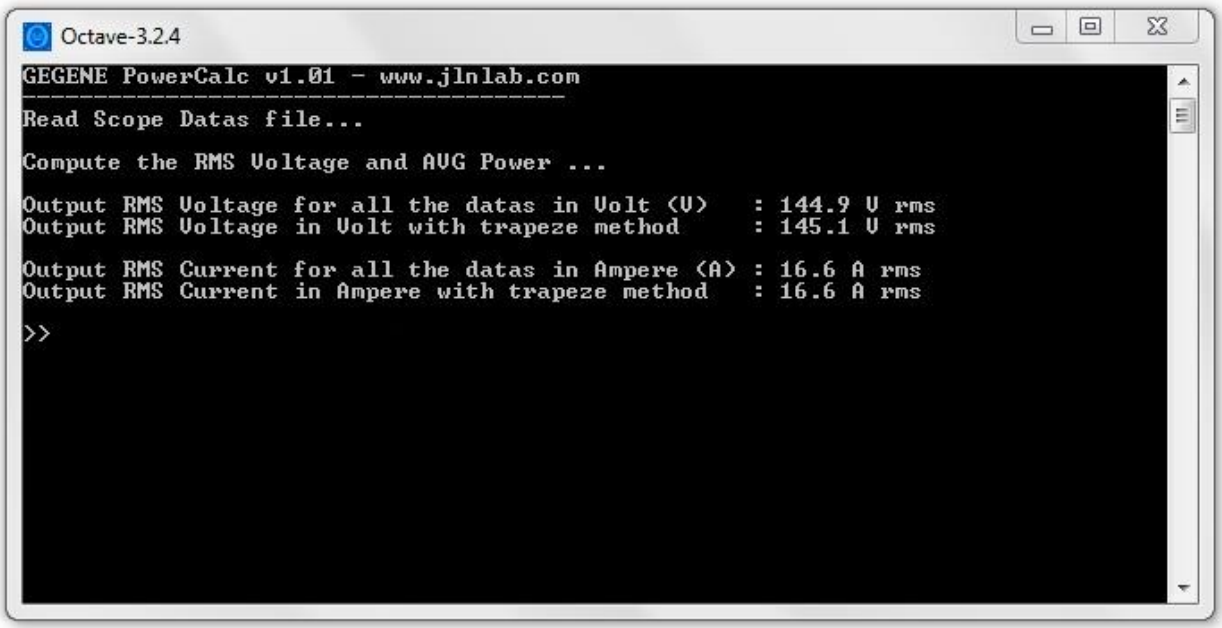




Editor's Note: Pout = V * I = 144.9V * 16.6A = 2405.34W output. Input power is Pin = 1148W. Efficiency = Pout / Pin = 2405.34W/1148W = 2.095. Therefore, 2.095 * 100% = 209.5% efficient.

We can also observe that the computed RMS current is very close to the measured value in real time by the digital oscilloscope.





You may download my full PowerCalc v1.01 software with the scope data used in this test, HERE.

Under Octave launch power_calc.

Comments: According to the results of this TEST#15, we can say that the electromagnetic disturbance on the Ch2 by the magnetic field surrounding the resistor is really negligible on the measurements and the computations of the power output of the GEGENE.

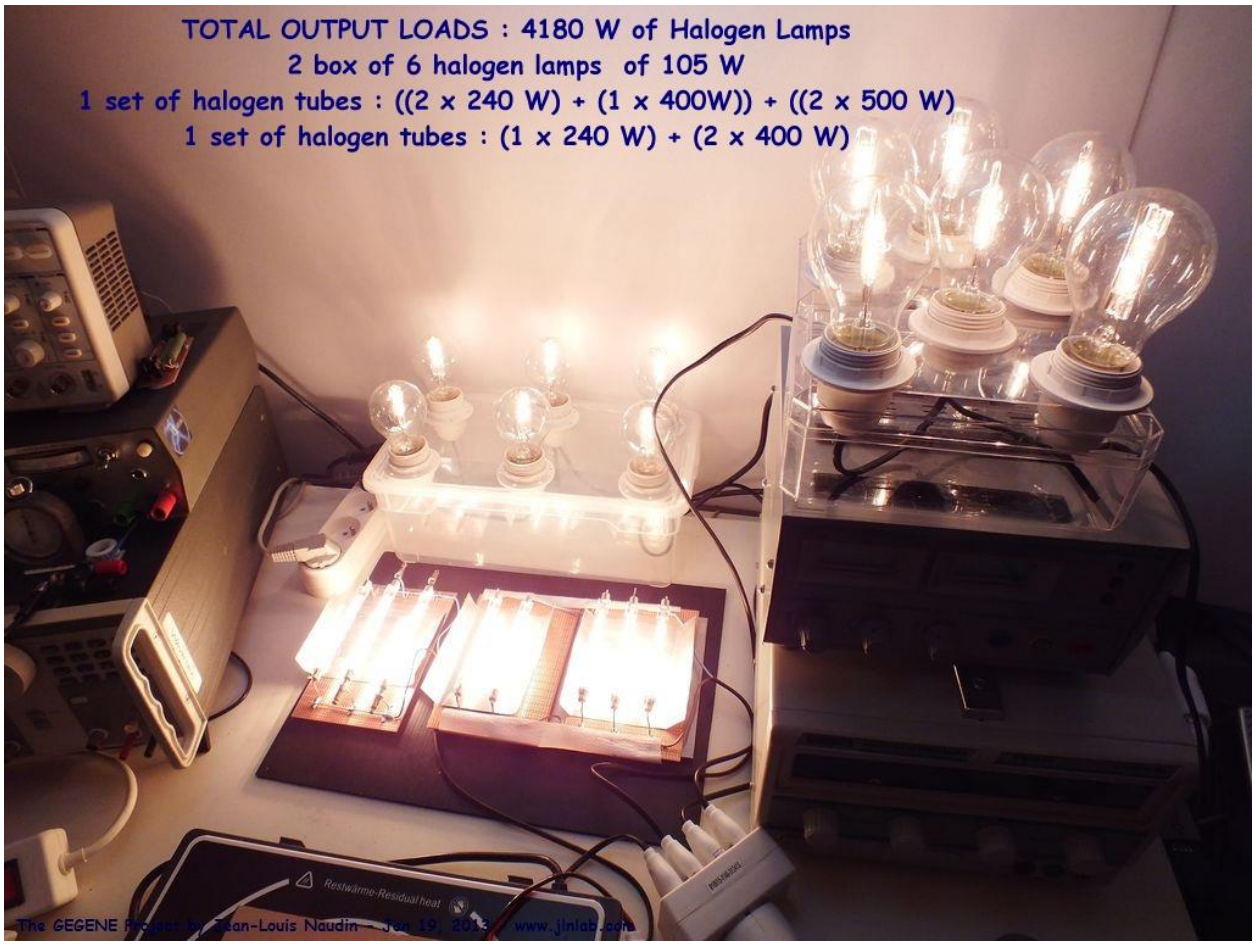
NEXT TEST:

TEST #16: Temperature of the output coil loaded with 4180 W of halogen lamps

TEST #16: Temperature of the Output Coil Loaded with 4180 W of Halogen Lamps

---

January 19, 2013 - TEST #16: Here is a very interesting test about the TEMPERATURE measurement of the bifilar Tesla coil connected at the OUTPUT loaded with **4180 Watts of halogen lamps**. Below the setup of the loads connected at the GEGENE output:



In this test, the output power has been limited to the level 5/10, i.e., at the middle power (about 1200 W).

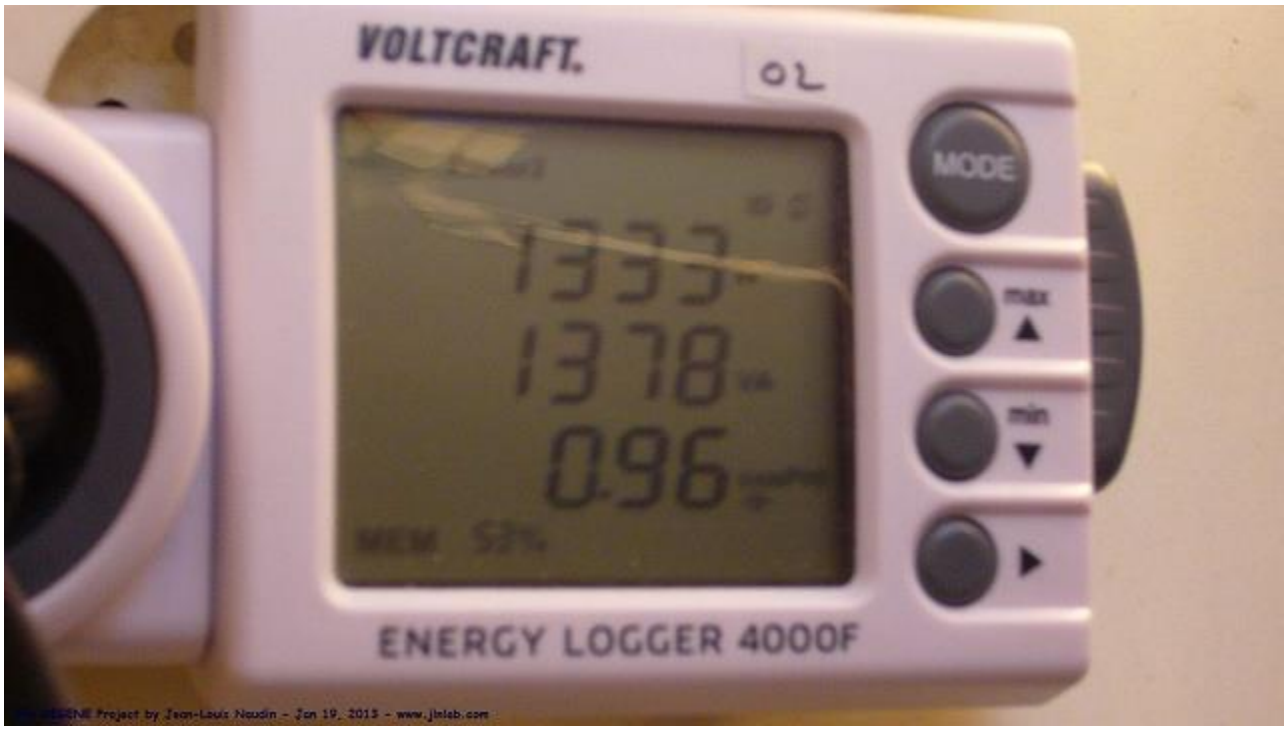
The surface temperature of the bifilar Tesla coil is measured with a thermometer which uses a thermopile sensor so as to avoid some eventual electromagnetic interference.

Below the electrical specifications of the flat Tesla bifilar coil connected at the output of the GEGENE.

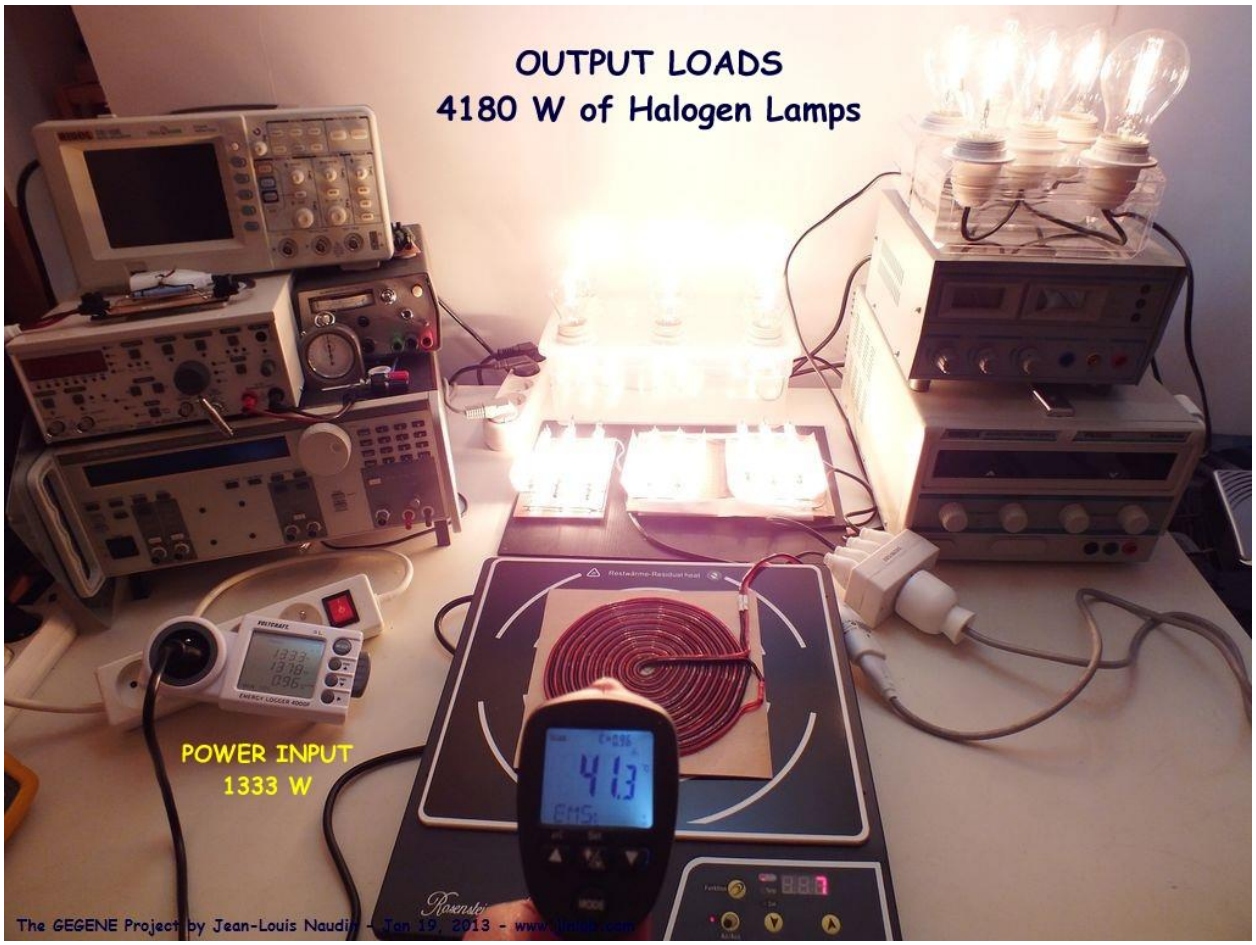

COIL Inductance
26.5 µH
L/C METER
MEASURE Lx
26.50uH
Zero Hi.C Hi.L L/C Func
Lx/Cx
+ −
The GEGENE Project by Jean-Louis Naudin - Jan 19, 2013 - www.jlnlab.com


0.21 Ω
0.05 Ω
COIL DC resistance
0.16 Ohm
The GEGENE Project by Jean-Louis Naudin - Jan 19, 2013 - www.jlnlab.com

The electrical power for the induction cooker is measured with a Wattmeter, Energy Logger 4000F, directly connected on the power grid:



The Wattmeter measures 1333 Watts at the INPUT of the induction cooker.


OUTPUT LOADS
4180 W of Halogen Lamps
POWER INPUT
1333 W
The GEGENE Project by Jean-Louis Naudin - Jan 19, 2013 - www.jlnlab.com

Comments: After some minutes of working, the temperature remains stable and the coil is only a bit warm in spite of the 4180 W of halogen lamps lit at the output. This is a very interesting characteristic here, because the warm up by Joule's effect is weak regarding to the high current produced at its output...

Here is the full video of the TEST #16

NEXT TEST:

TEST #17: **A High Power HHO Generator with the GEGENE**

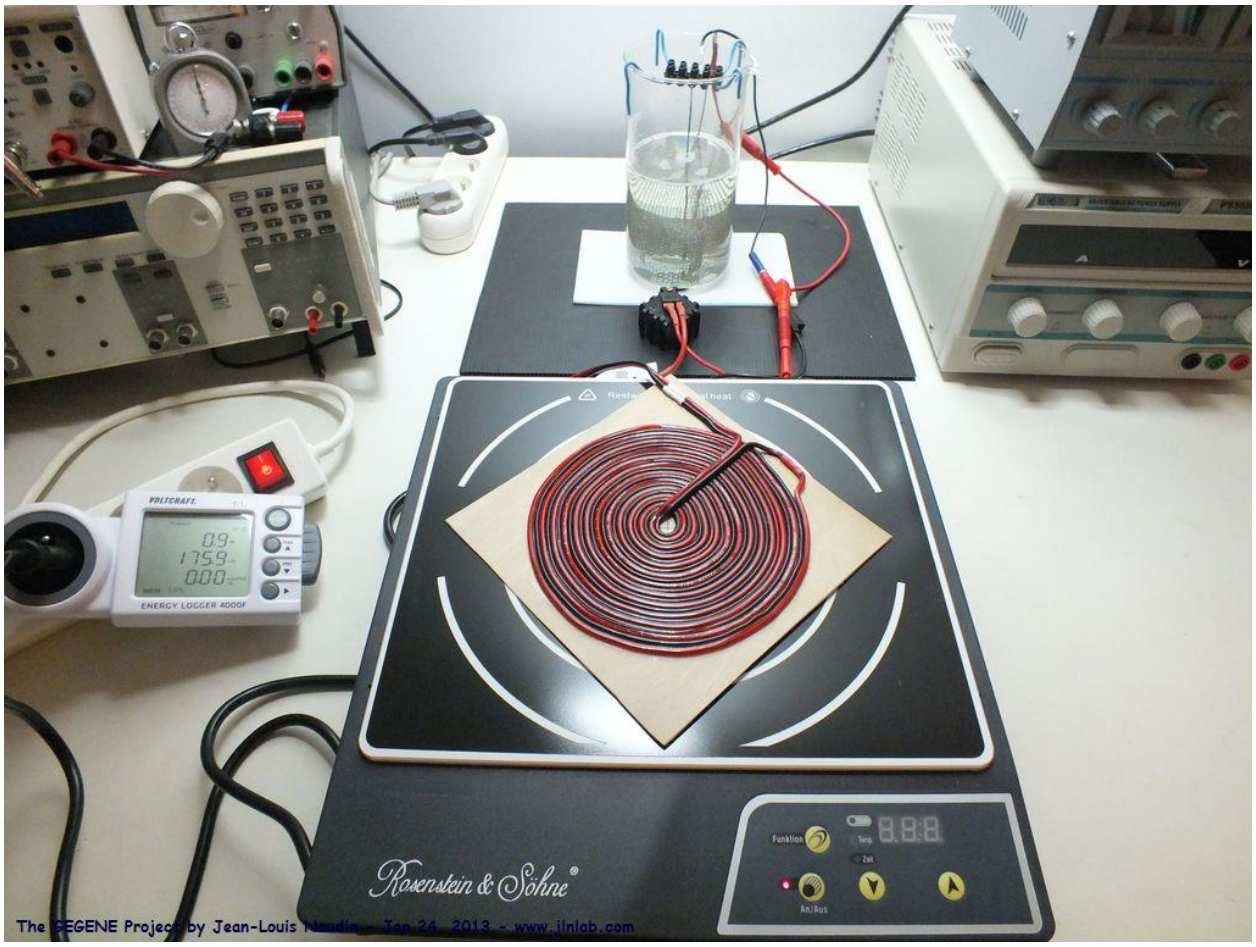
TEST #17: A High Power HHO generator with the GEGENE

January 24, 2013 - TEST #17: Here is a new very interesting experiment with the GEGENE. Some recent papers and experiments have demonstrated that the electrolysis efficiency can be significantly improved by using very short pulsed currents at high frequency; here are some references below:

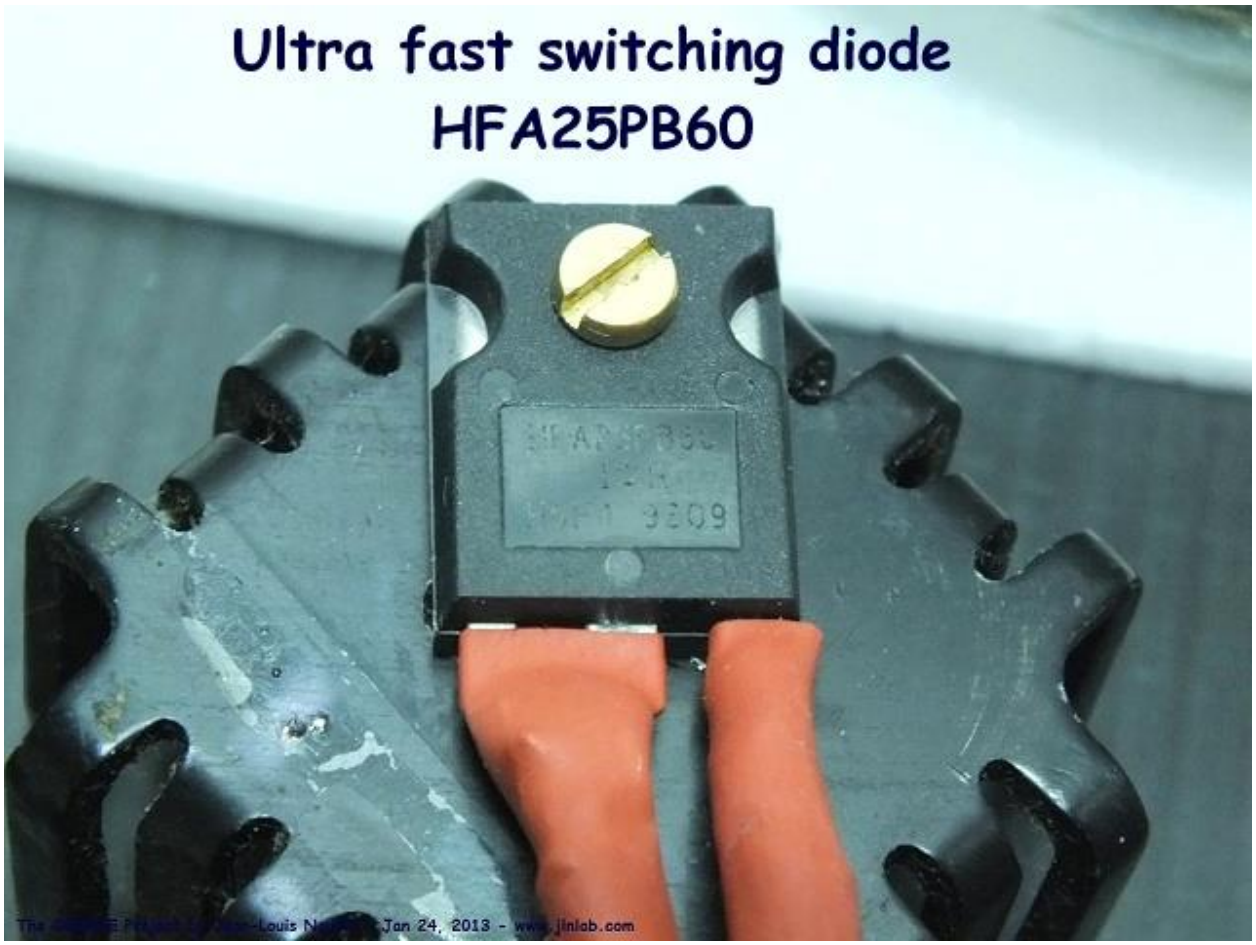
- **Water Electrolysis with Inductive Voltage Pulses** by Martins Vanags, Janis Kleperis and Gunars Bajars - DOI: 10.5772/52453
- **A novel method of hydrogen generation by water electrolysis using an ultra-short-pulse power supply** by Naohiro Shimizu, Souzaburo Hotta, Takayuki Sekiya and Osamu Oda (NGK Insulators, Ltd., Japan) - Journal of Applied Electrochemistry (2006) 36:419–423
- **Economical hydrogen production by electrolysis using nano pulsed DC** by Dharmaraj C.H, AdishKumar S. - IJEE IEE Foundation Vol 3, Issue 1, 2012 pp.129-136
- **Stanley MEYER Resonant Electrolysis Cell System**

The purpose of this preliminary experiment is to connect at the output of the flat bifilar Tesla coil of the GEGENE a classical electrolysis cell and to observe in the first time the amount of gas produced.

Here is the setup of the TEST #17:

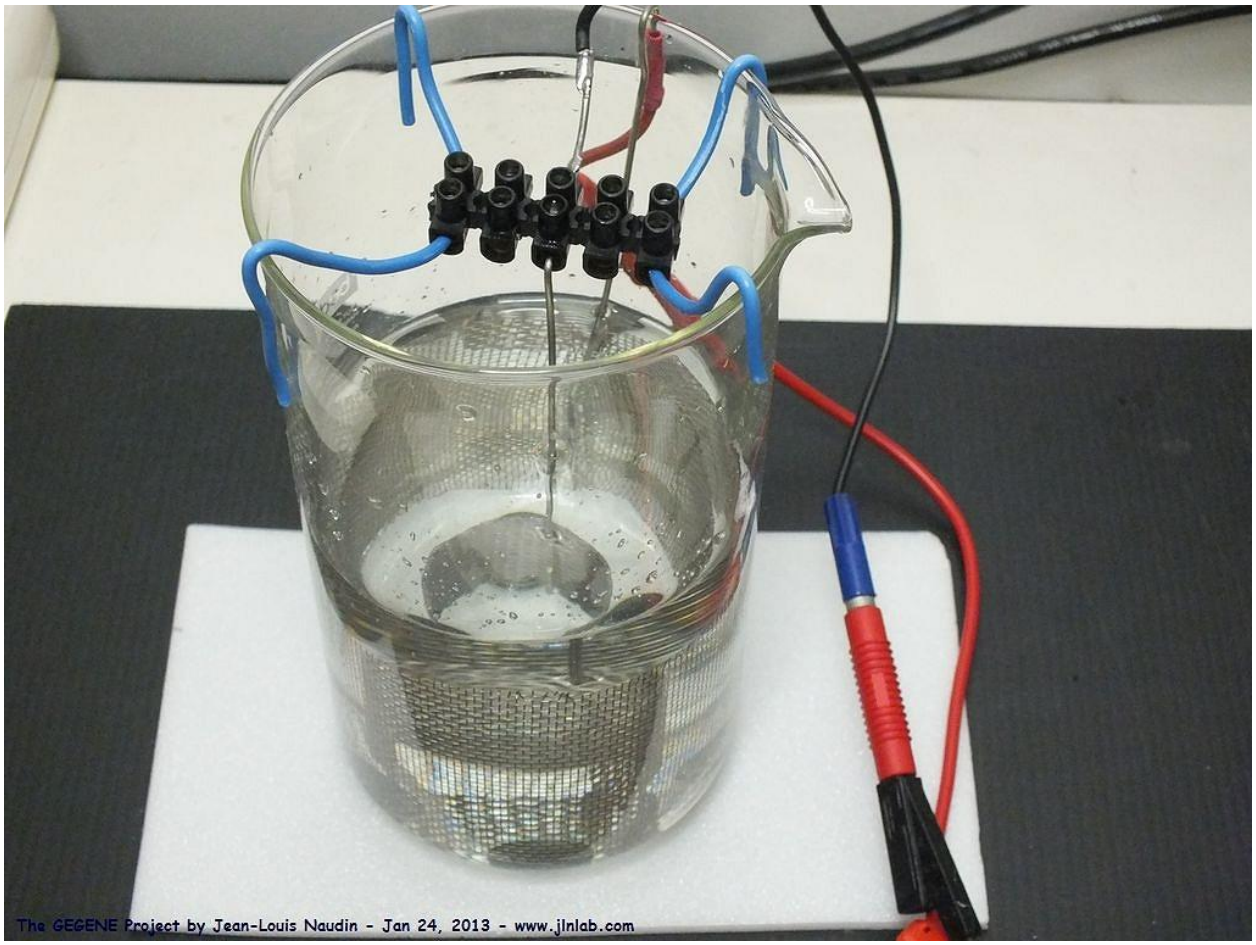


The High Frequency is rectified via an ultra fast HFA25PB60 diode so as to produce High Frequency DC pulses across the electrolysis cell.



The full datasheet of the diode can be found HERE.

Below are the details of the electrolysis cell used for this "proof of concept" experiment.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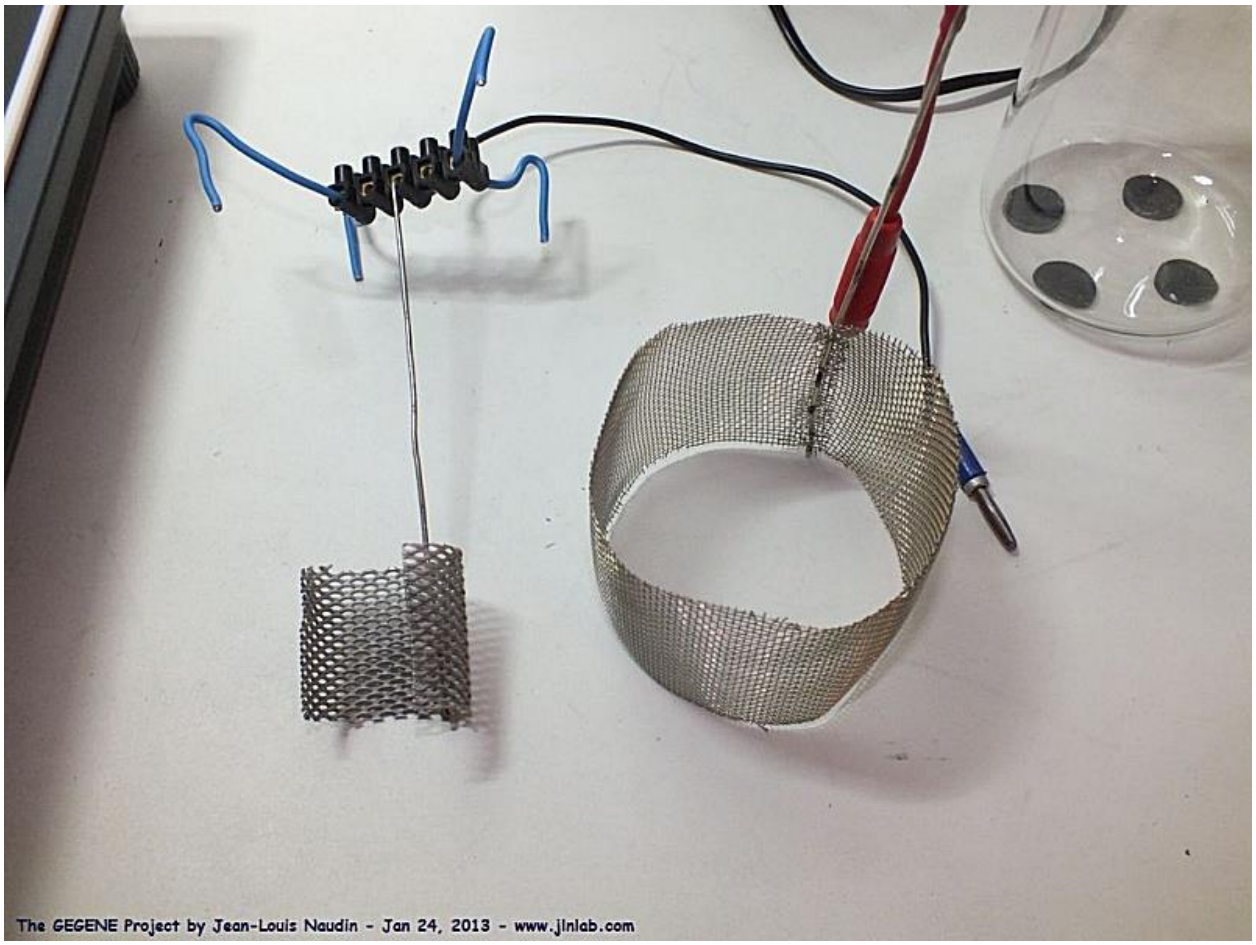
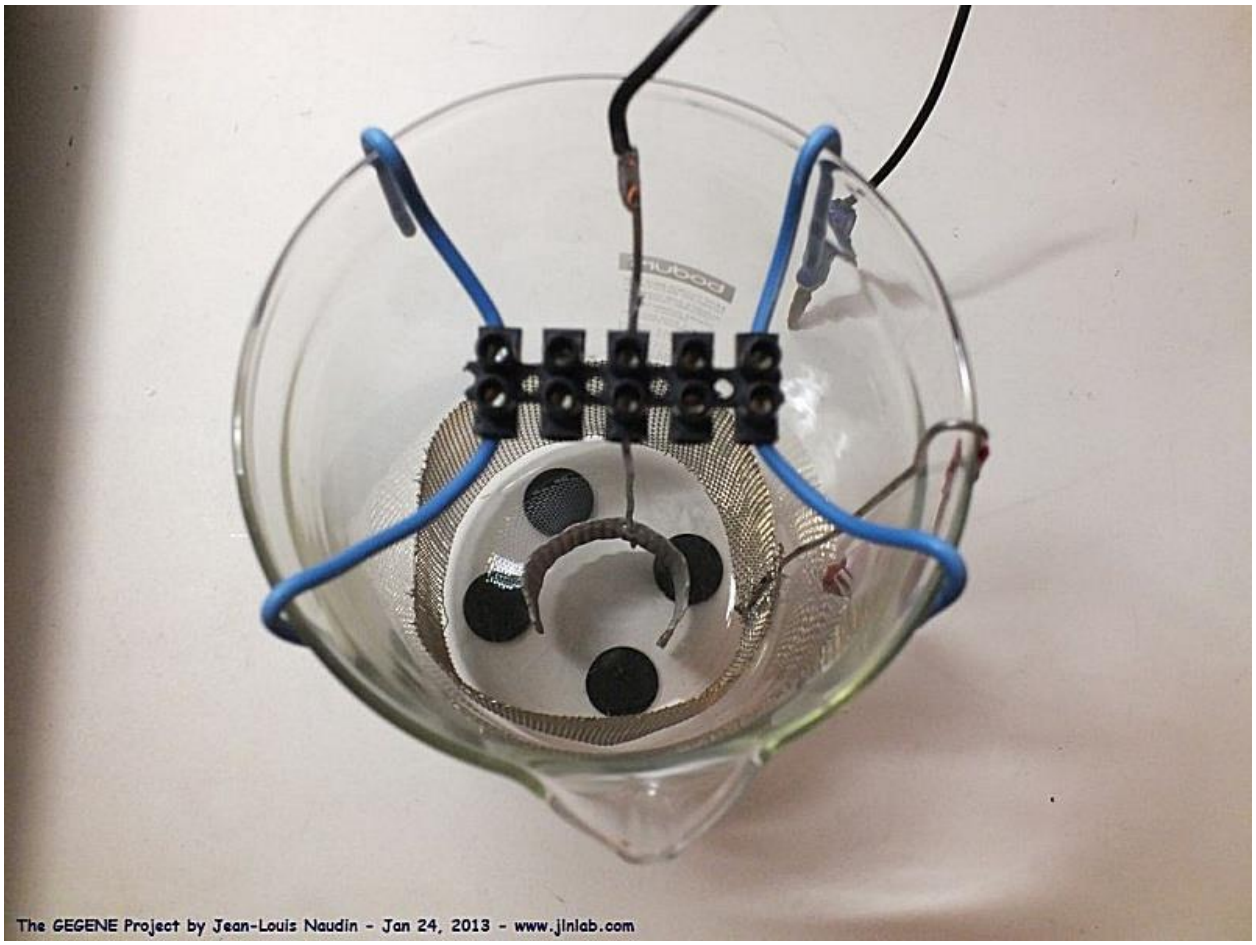
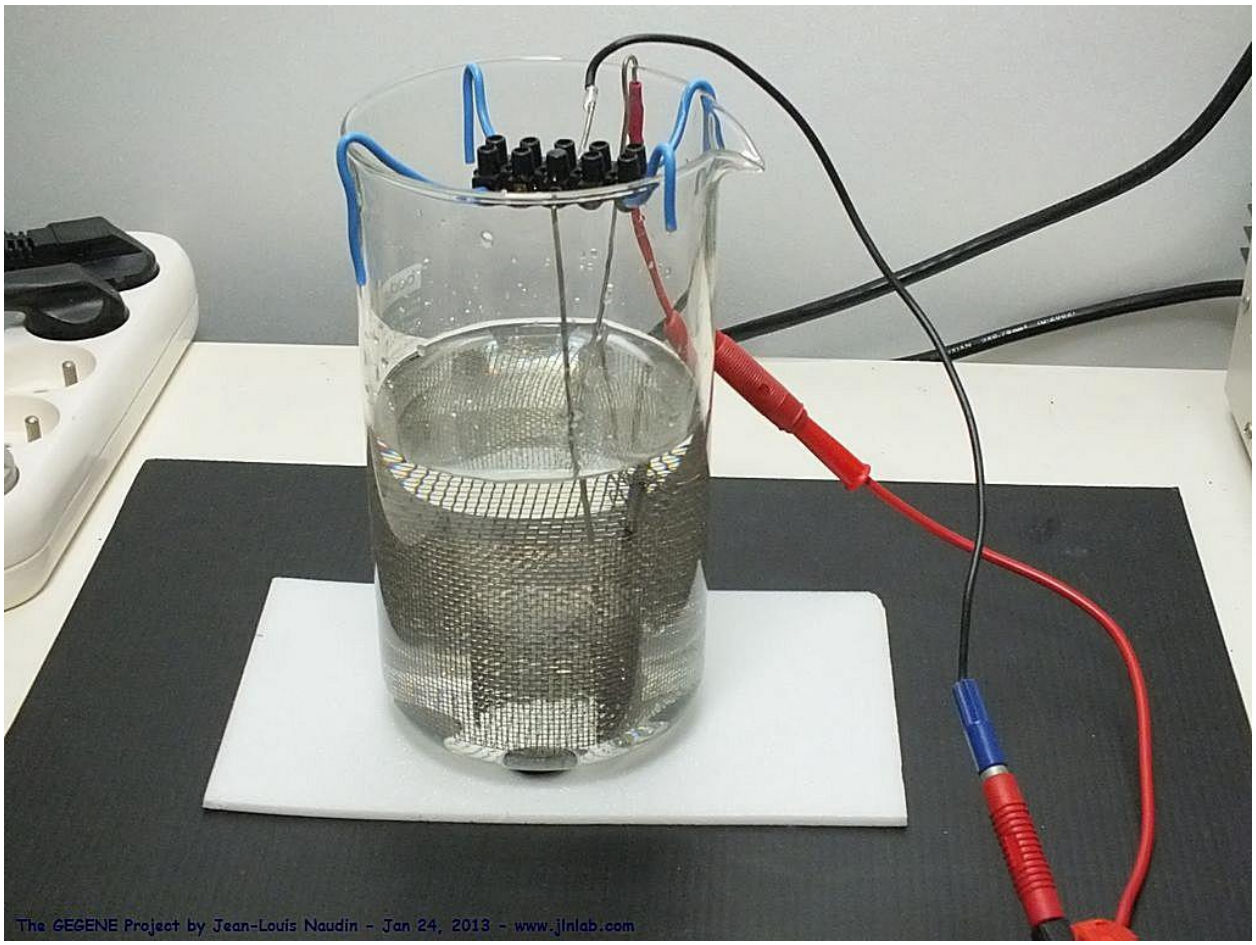


The cathode (on the left) is a mesh of titanium and the anode (on the right) is a mesh of stainless steel.


The GEGENE Project by Jean-Louis Naudin - Jan 24, 2013 - www.jlnlab.com



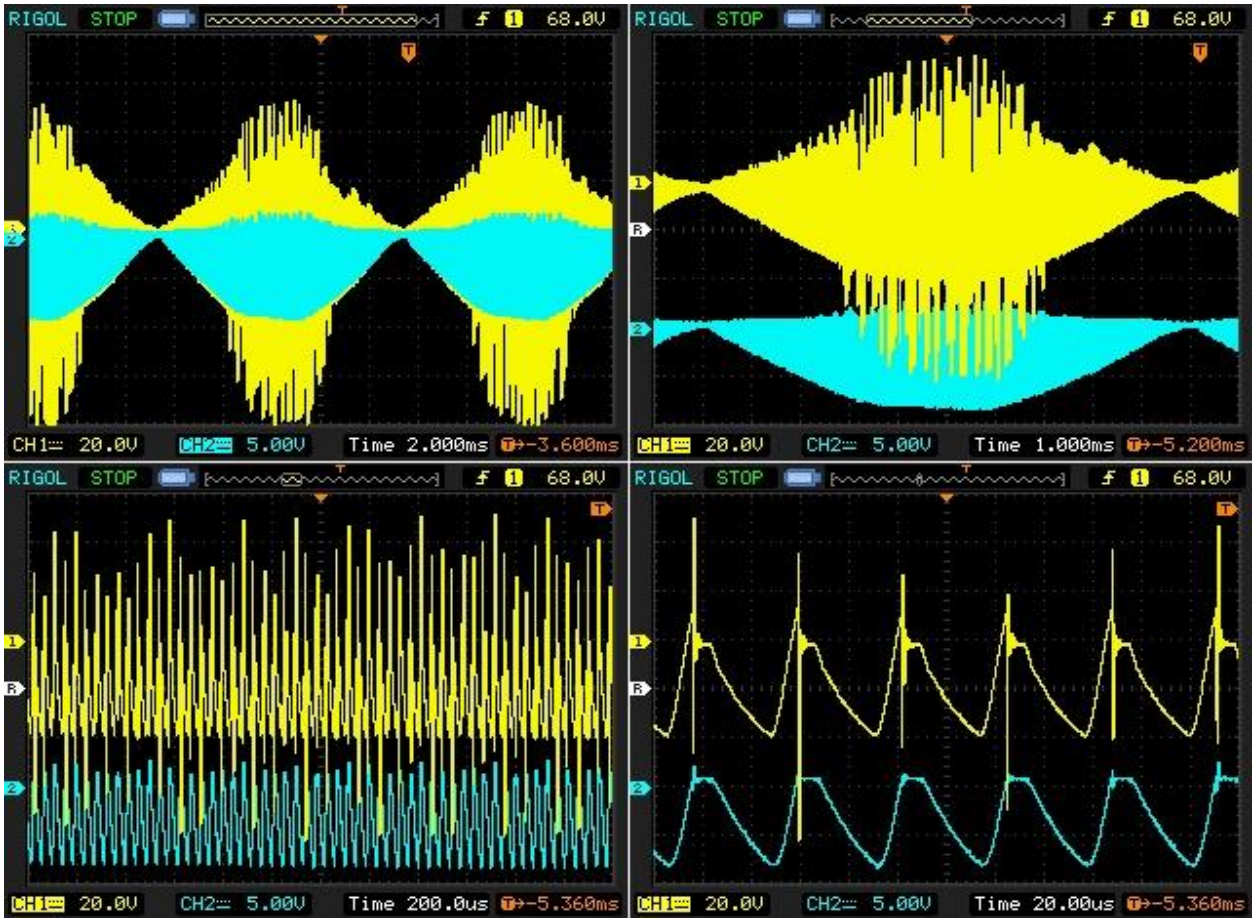
The electrolysis cell is filled with 800 mL of a 0.5 M solution of K_2CO_3 (Potassium carbonate).

Editor's Note: 0.5 moles of K_2CO_3 equals 69 grams of K_2CO_3. Also, use 800mL of distilled water.

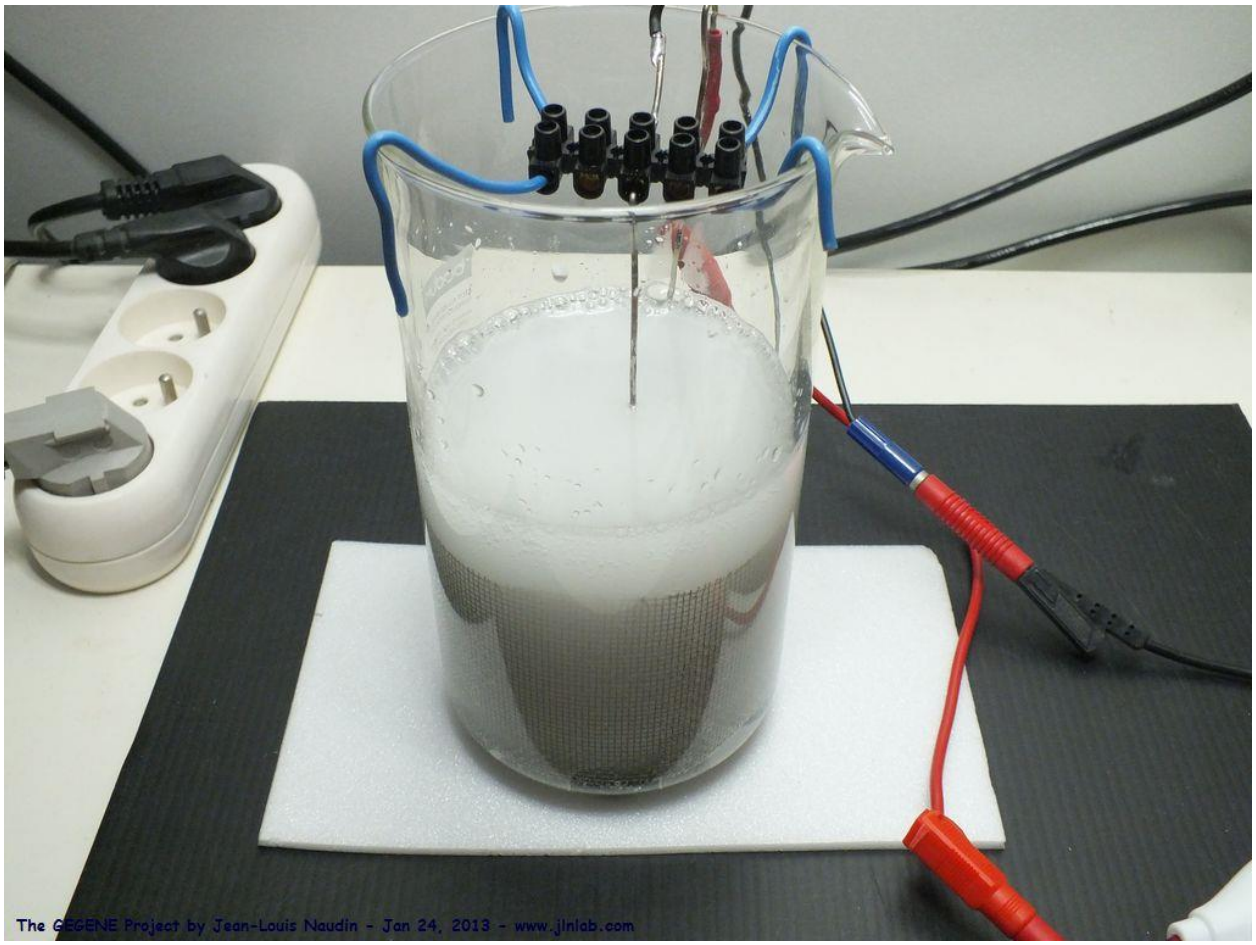
You may also use Baking Soda ($NaHCO_3$) which can be found easily in any food store...

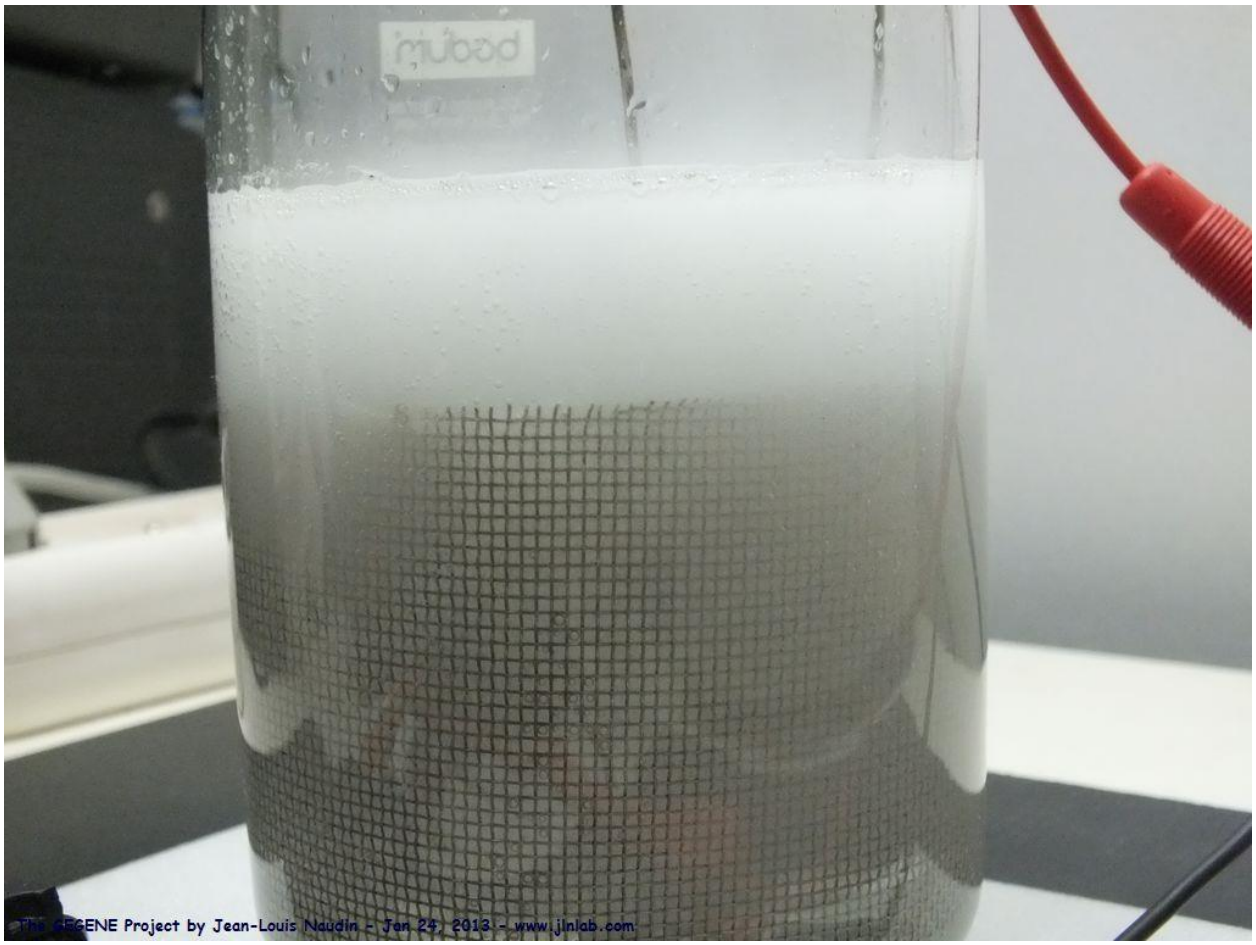
Editor's Note: 0.5 moles of $NaHCO_3$ equals 42 grams of $NaHCO_3$.

Below the wave produced across the electrolysis cell. We can observe (on the bottom right) that very short pulses of current are produced.



As soon as the induction cooker is started, a great amount of HHO (stoechiometric mixture of Di-Hydrogen and Di-Oxygen gas) is quickly produced.


The GEGENE Project by Jean-Louis Naudin - Jan 24, 2013 - www.jlnlab.com


The GEGENE Project by Jean-Louis Naudin - Jan 24, 2013 - www.jlnlab.com

If a flame is approached to the surface of the liquid a short and loud detonation is produced. There is no doubt here, this is the HHO...

Comments: This is a very simple and easy replicable experiment and it confirms that the output wave of the GEGENE is able to power without problem an electrolysis cell so as to produce quickly a great amount of HHO...

Here is the full video of the TEST #17:

https://youtu.be/k2xTBj69Q1Y

Reference documents:

- **Water Electrolysis with Inductive Voltage Pulses** by Martins Vanags, Janis Kleperis and Gunars Bajars - DOI: 10.5772/52453
- **A novel method of hydrogen generation by water electrolysis using an ultra-short-pulse power supply** by Naohiro Shimizu, Souzaburo Hotta, Takayuki Sekiya and Osamu Oda (NGK Insulators, Ltd., Japan) - Journal of Applied Electrochemistry (2006) 36:419–423

- **Economical hydrogen production by electrolysis using nano pulsed DC** by Dharmaraj C.H, AdishKumar S. - IJEE IEE Foundation Vol 3, Issue 1, 2012 pp. 129-136
- **Stanley MEYER Resonant Electrolysis Cell System**

The WFC BOOSTER (Stanley Meyer's Water Fuel Cell)

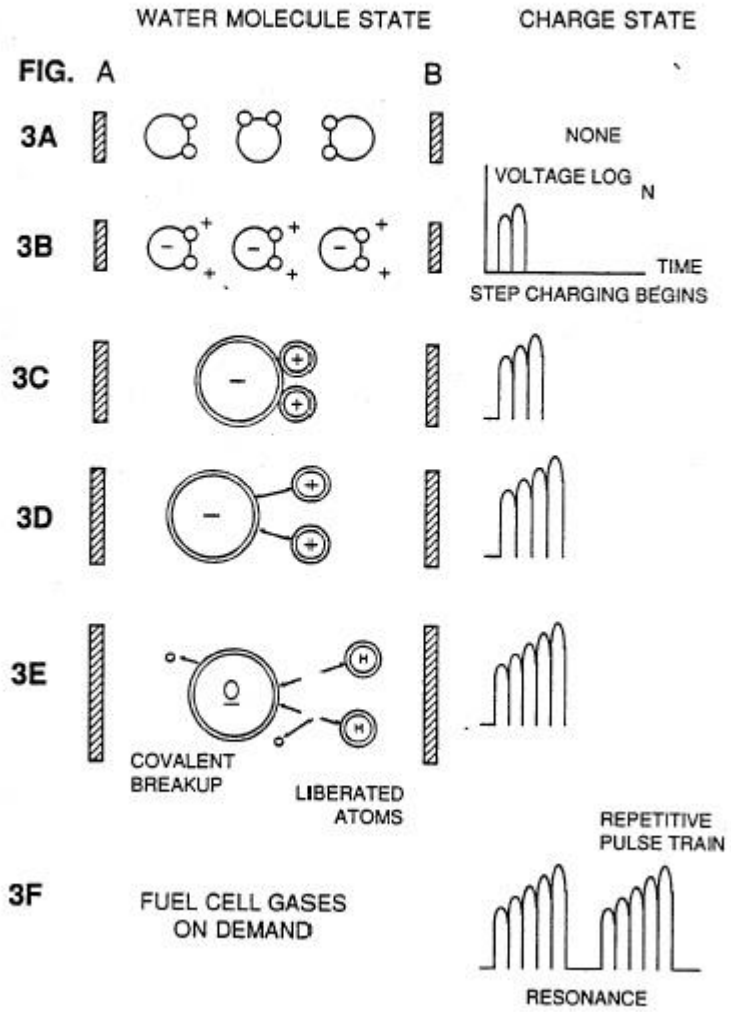
The season 2 of the project *GEGENE (Great Efficiency GENErator)*...

This is the following of the GEGENE project which uses the interesting characteristics of a flat bifilar Tesla coil with an induction cooker as a High Frequency and High Power generator. The main specification of the GEGENE (Great Efficiency GENErator) is that it uses a BIFILAR PANCAKE COIL patented by Nikolas TESLA in 1894 in the patent N° 512,340. In the GEGENE the flat bifilar coil is electromagnetically coupled with the main flat coil of the induction cooker and acts as the secondary coil for the output. The driving and the controlling are fully done by the main electronic controller of the induction cooker itself. So, no special electronic equipment or laboratory measurement tools are required here to succeed in this experiment. You need only: an induction cooker (for less than 50€), a dual flexible wire (speaker wire or grid wire) and some electrical connectors and plugs...

Introducing the WFC Booster project

The main purpose of the WFC Booster is trying to generate efficiently, and with a great amount, a HHO gas (a stoechiometric mixture) which can be used as an alternative fuel. The process used here is based on the WFC (Water Fuel Cell) invented by Stanley Meyer in 1990 and which consist to break the water molecule by a parametric elongation of the hydrogen-oxygen bond. This parametric

elongation of the water molecule, according to the Stanley Meyer principle, is done by using High Voltage nano pulses at high frequency across a cylindrical capacitor immersed in water. The main particularity of the Stanley Meyer's WFC is that it uses the ordinary tap water without any addition of electrolyte like a common electrolyzer. Below some pages of the initial Stanley Meyer patent which shows the working principle of the Water Fuel Cell:



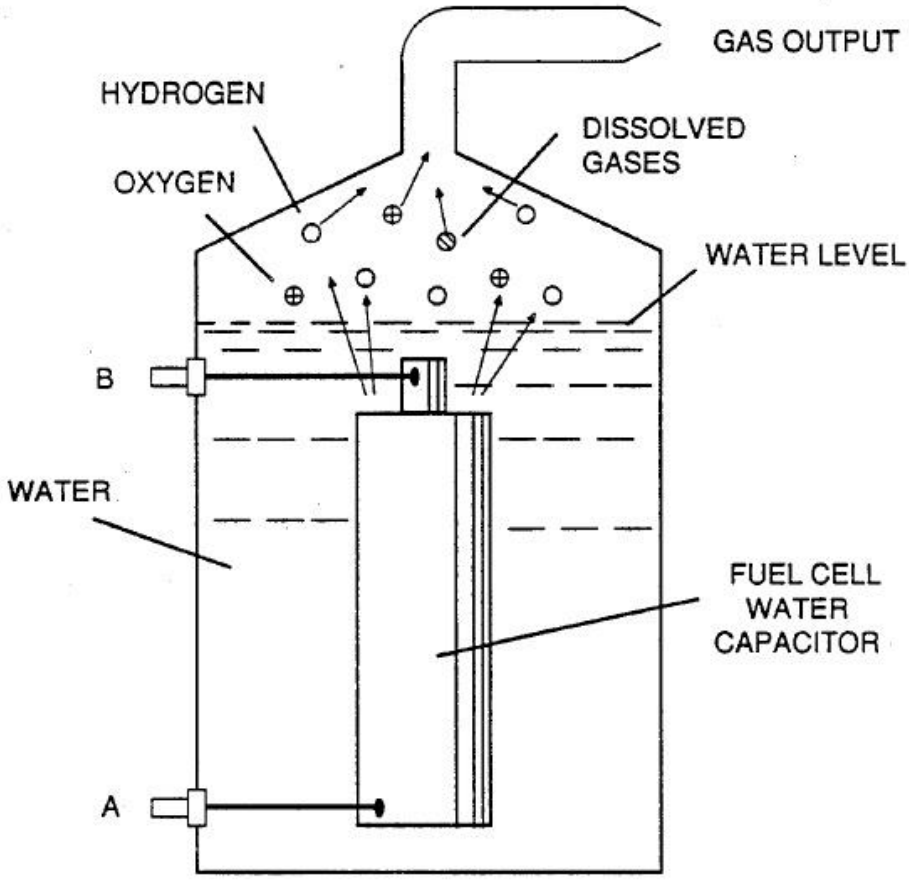
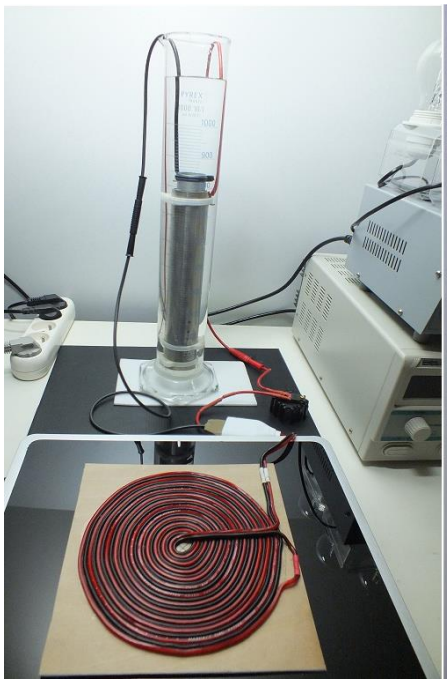

GAS OUTPUT
HYDROGEN
DISSOLVED GASES
OXYGEN
WATER LEVEL
B
WATER
FUEL CELL WATER CAPACITOR
A

FIGURE 2



The last update from February 7, 2013
TEST-S02EP01: The "proof of concept" experiment of the WFC Booster with the GEGENE
TEST-S02EP02: **SUCCESSFUL** replications of the HHO generator and the Water Fuel Cell by WOOPY
TEST-S02EP03: Test of the Water Fuel Cell with PURE OSMOSED WATER and the GEGENE v3.0
TEST-S02EP04: Electrical measurements on the Water Fuel Cell with pure osmosed water
TEST-S02EP05: The Water Fuel Cell tested with the Stanley Meyer's VIC pulsed signal...
TEST-S02EP06: Improvement of the parametric wave measured across the WFC

Here is a full video of the WFC Booster in action.

Here is a CLOSE VIEW of the WFC Booster in Action.

Links and references:

- **The Stanley MEYER Resonant Electrolysis Cell System**
- **Water Electrolysis with Inductive Voltage Pulses** by Martins Vanags, Janis Kleperis and Gunars Bajars - DOI: 10.5772/52453
- **A novel method of hydrogen generation by water electrolysis using an ultra-short-pulse power supply** by Naohiro Shimizu, Souzaburo Hotta, Takayuki Sekiya and Osamu Oda (NGK Insulators, Ltd., Japan) - Journal of Applied Electrochemistry (2006) 36:419–423
- **Economical hydrogen production by electrolysis using nano pulsed DC** by Dharmaraj C.H, AdishKumar S. - IJEE IEE Foundation Vol. 3, Issue 1, 2012 pp. 129-136
- **Stanley MEYER Resonant Electrolysis Cell System**
- **The Dave Lawton's Replication of Stan Meyer's Water Fuel Cell**
- **Water Fuell Cell - technical brief**
- **WATERpoweredcar.com**

TEST #18: Test of the GEGENE with a QUARTZ HEATER and a New Tesla Coil

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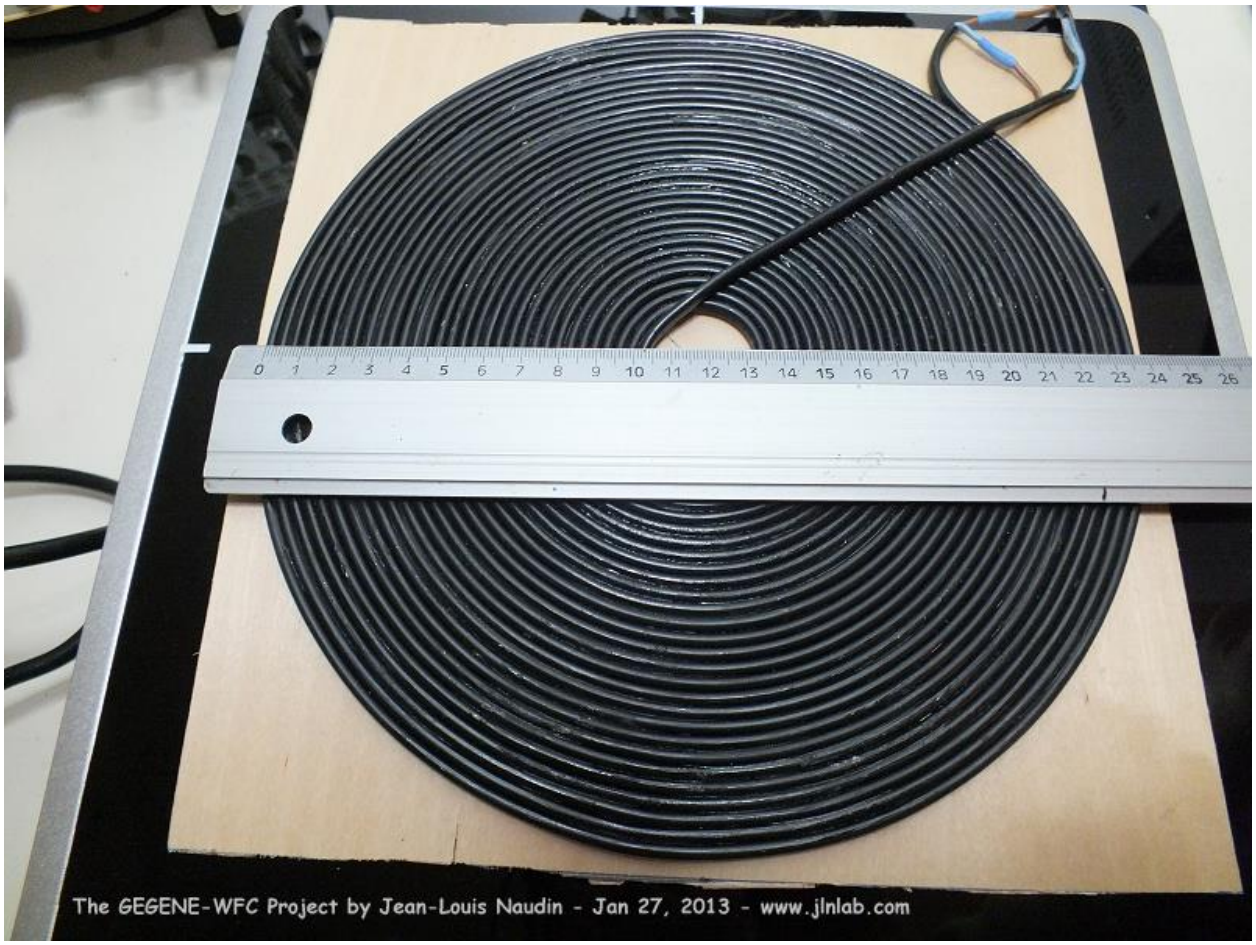
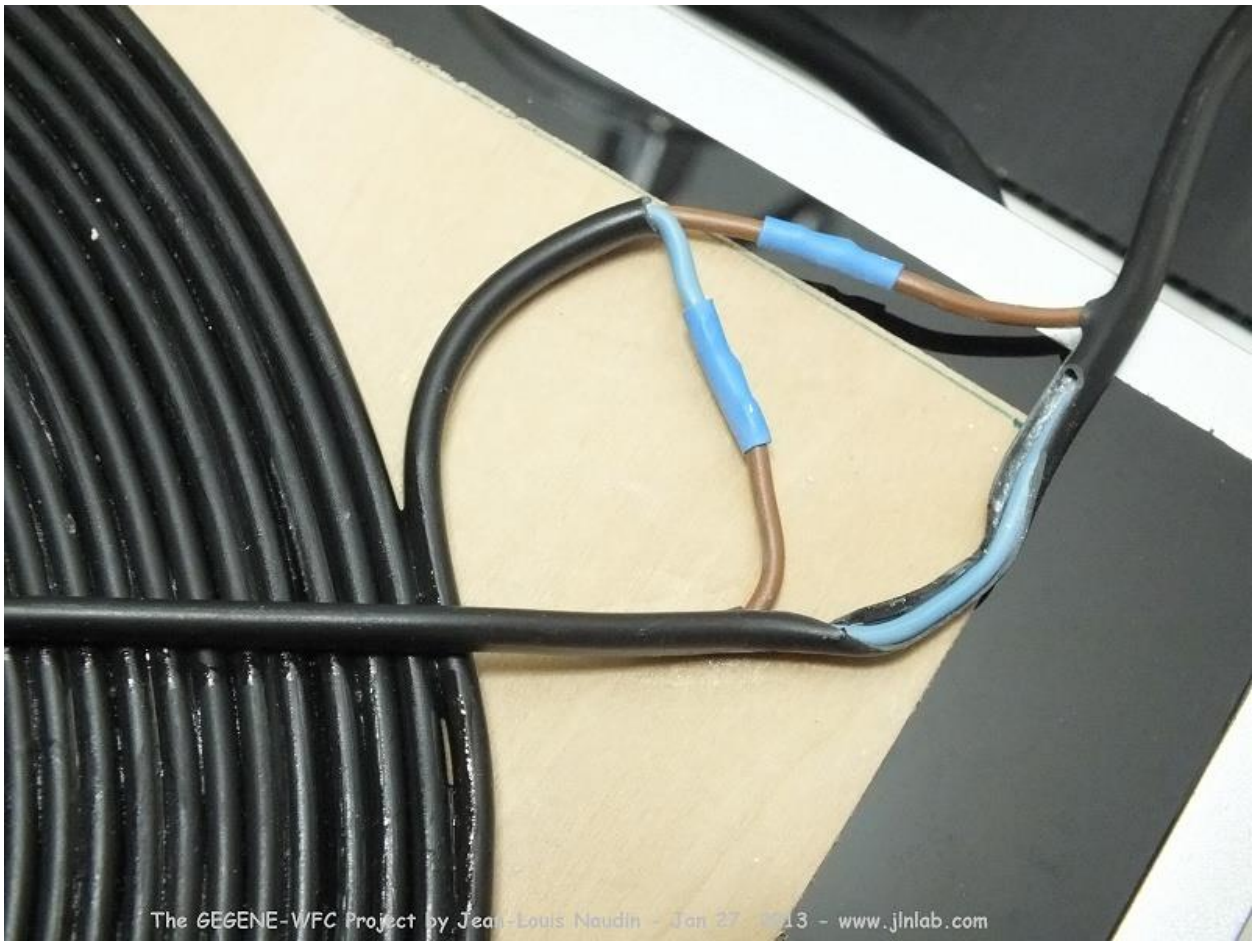
January 30, 2013 - TEST #18: Here is a test of the GEGENE v2.0 with its new flat bifilar Tesla coil which has been tested successfully with the WFC of Stanley Meyer. In this test, I have tried this new coil with a QUARTZ ELECTRIC HEATER rated for 1800 W and powered via the induction cooker, Unold (ref 58235).

Here are the construction details of the new flat bifilar Tesla coil:


0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
The GEGENE-WFC Project by Jean-Louis Naudin - Jan 27, 2013 - www.jlnlab.com


LOCTITE
SUPER
GLUE-3
The GEGENE-WFC Project by Jean-Louis Naudin - Jan 27, 2013 - www.jlnlab.com



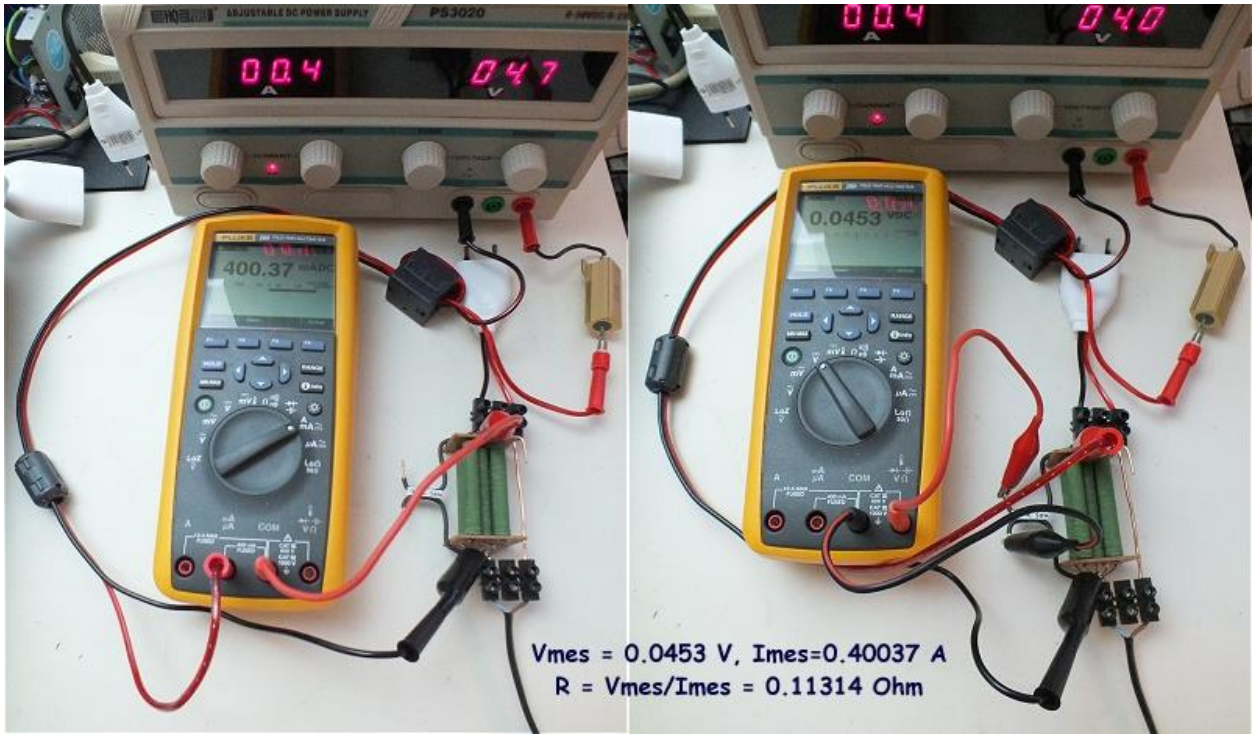
The quartz heater is tuned to the max power (level 3) and it is rated for 1800 W at this level.


IF-03
230V~ 50Hz,1800W
Lot #:1105
N° Constructeur NF:1851ED
N° 1122
IP24
CE
NF
LCIE
ELECTRICITE
SCA BRICOLAGE
24 rue Auguste Chabrières F- 75015 PARIS
Fabriqué en Chine

To conduct long duration tests and for avoiding the overheating of my old non inductive 10W resistor used as a current probe, I have built a new 50 W non inductive resistor for the current measurement. This current probe is built with five 0.56 Ohm NON INDUCTIVE resistors, Mundorf MR10 of 10 W and connected in parallel.

The exact value of this "current probe" is precisely measured with a digital multimeter by using the 4 wires method (Thanks to Zgreudz...).

The value of this current probe resistor is R = 0.11314 Ohm.

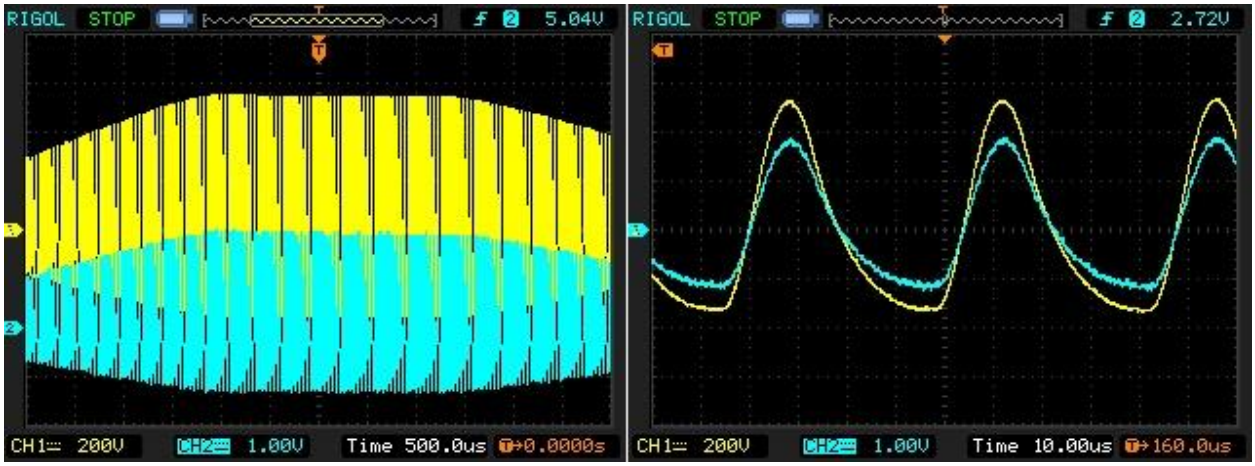


TEST #18 RESULTS:

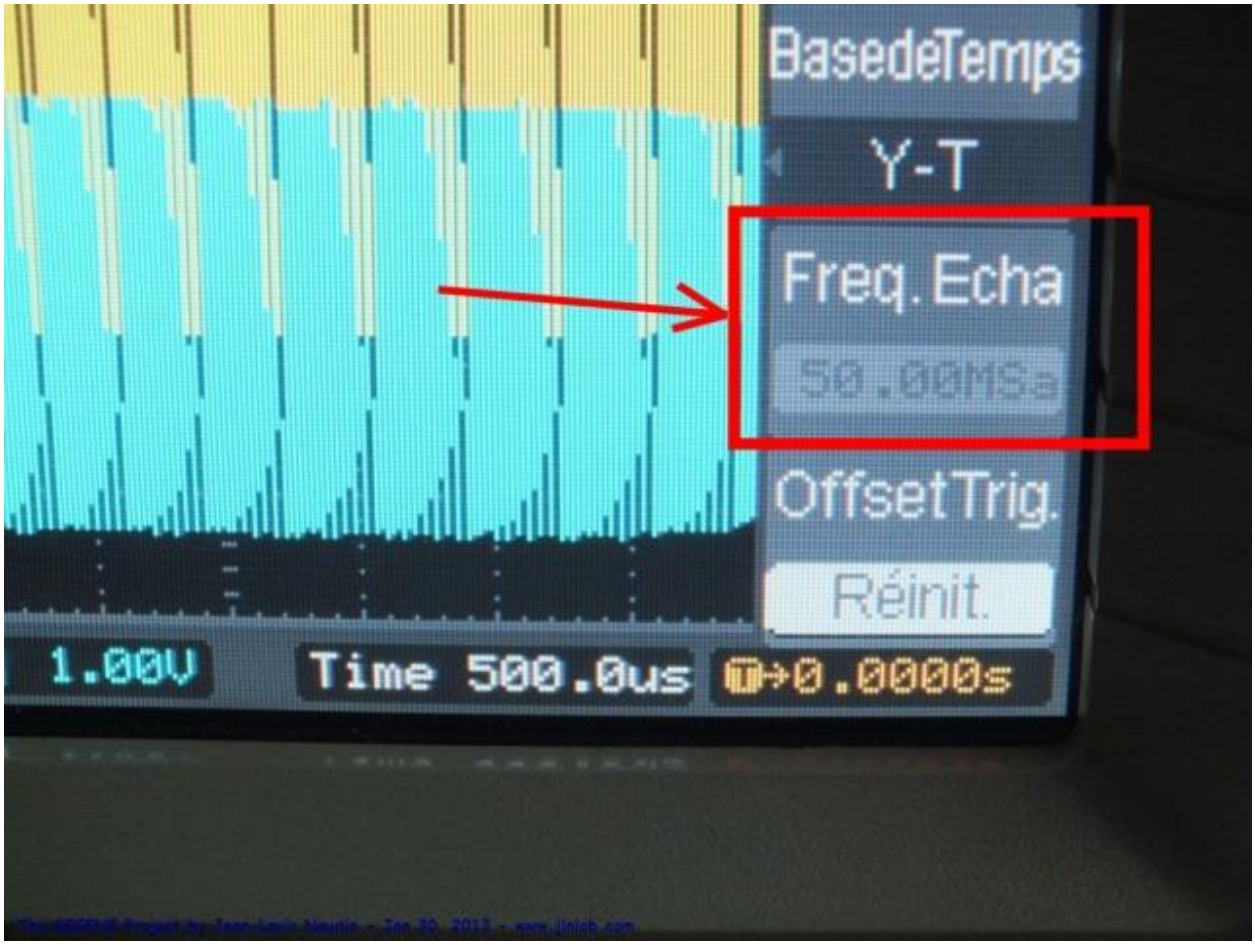
To measure the voltage and the current at the output for powering the quartz heater, the two scope probes are connected to the flat bifilar coil output. The probe Ch1 (a new HV probe x100) is used to measure the voltage across the flat bifilar coil output and the probe Ch2 is used to measure the current i.e. the voltage across a 0.11314 Ohm non inductive resistor current probe. Then the data are sent to a computer to compute true RMS values and the efficiency under Octave (or MatLab). The electrical power input of the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid.

In this test the induction cooker is set to the max power (2000W). There is no need to use a ferromagnetic sheet to start the induction cooker.

The values of the voltages are measured with a Rigol digital scope, the sampling rate is set to **50 MSa/sec**.



As you may see in the right oscillogram above, there is no phase shift between the current and the voltage.

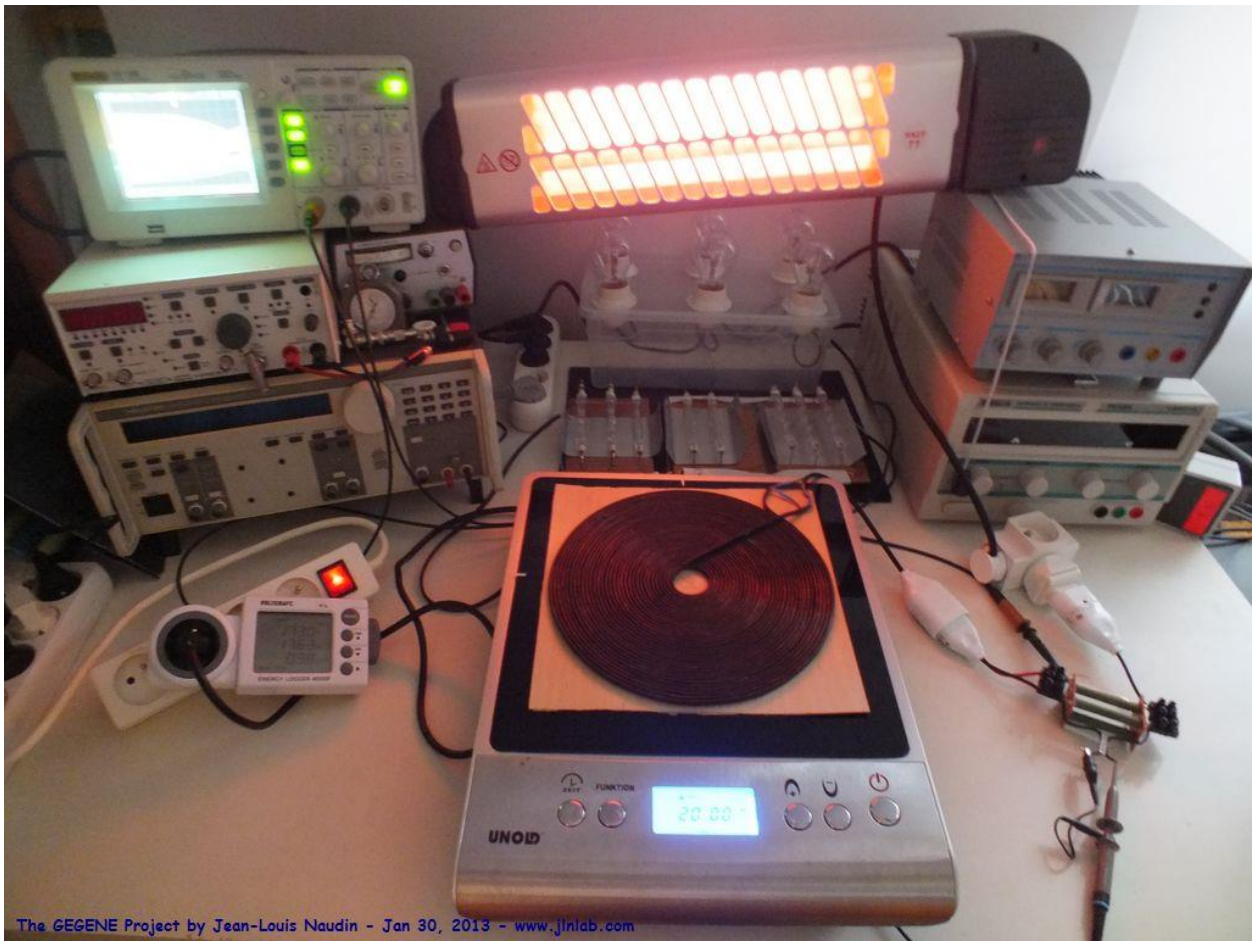



HAUT
↑↑
The GEGENE Project by Jean-Louis Naudin - Jan 30, 2013 - www.jnlab.com

The electrical power for the induction cooker is measured with a Wattmeter Energy Logger 4000F directly connected on the power grid:

The Wattmeter measures 1733 Watt at the INPUT of the induction cooker.

The quartz heater is heating at FULL POWER and its heat was so strong that I have needed to open the windows of the lab...


UNOLD
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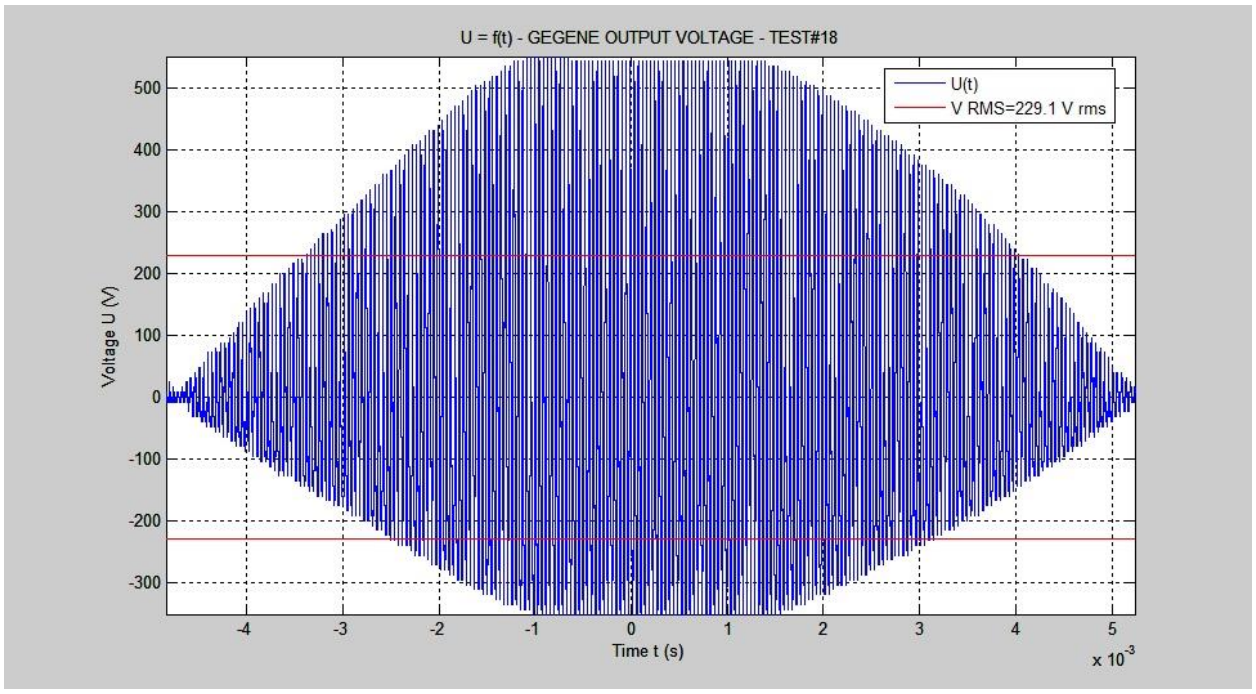
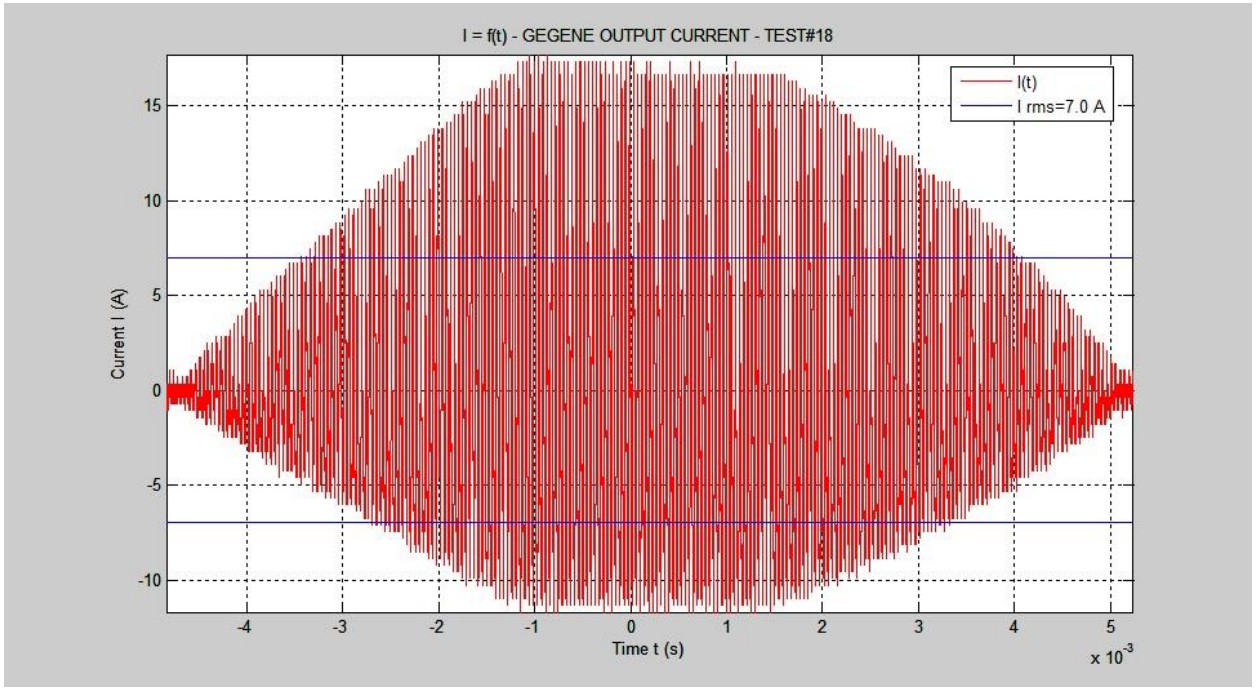
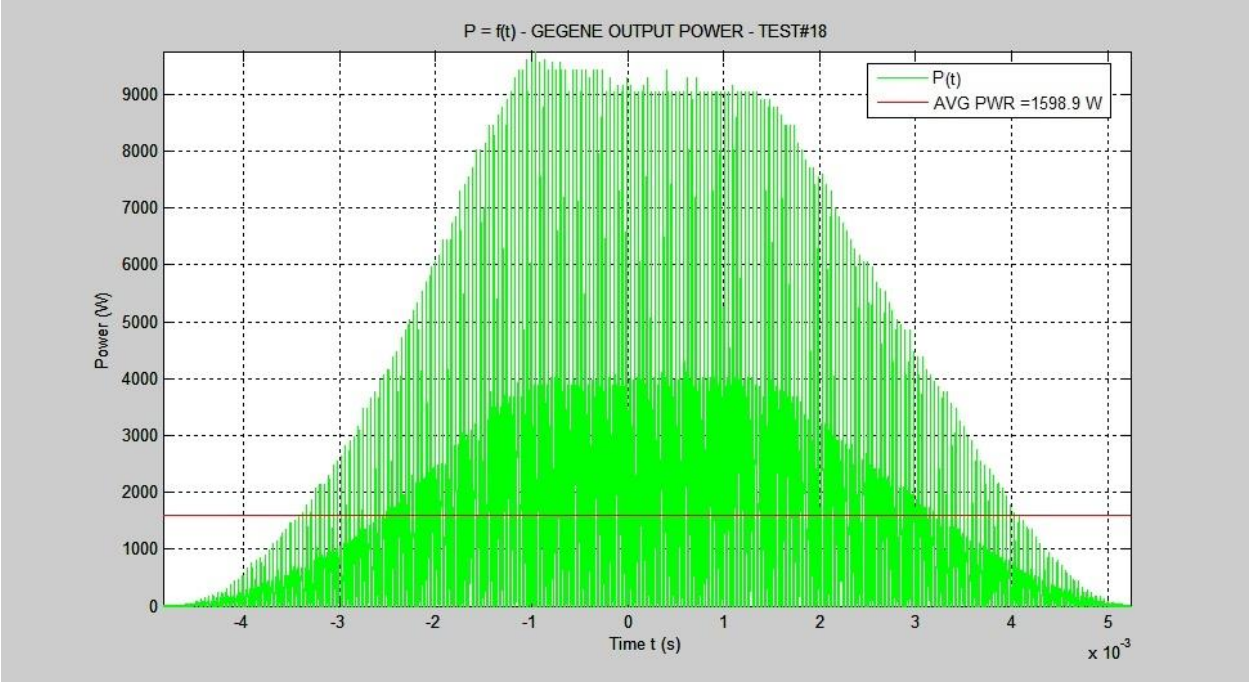
Below, the scope data computed with GNU Octave 3.2.4 (freeware and full compatible version of MATLAB).


U = f(t) - GEGENE OUTPUT VOLTAGE - TEST#18
U(t)
V RMS=229.1 V rms
Voltage U (V)
Time t (s)
x 10^-3


I = f(t) - GEGENE OUTPUT CURRENT - TEST#18
I(t)
I rms=7.0 A
Current I (A)
Time t (s)
x 10^-3




```
GEGENE PowerCalc v1.02 - www.jlnlab.com
---------------------------------------
Read Scope Datas file...

Compute the RMS Voltage and AVG Power ...

Output RMS Voltage for all the datas in Volt (V)    : 229.1 V rms
Output RMS Voltage in Volt with trapeze method      : 229.1 V rms

Output RMS Current for all the datas in Ampere (A) : 7.0 A rms
Output RMS Current in Ampere with trapeze method    : 7.0 A rms

---> OUTPUT AVG Power (VTG_rms * CUR_rms): 1598.9 Watt
---> OUTPUT AVG Power (Trapeze method)    : 1595.6 Watts
>>
```

I recall again that the sampling rate during the data acquisition was **50 MSa/sec** and that the computation done under Octave (or MatLab) has been done dot by dot on a full time scale.

You may download my full PowerCalc v1.02 software with the scope data used in this test, HERE.

Under Octave launch power_calc.

Below the full video of the TEST #18.