

# ESSaver PUE

**Energy monitoring with software**



**Energy Software Solutions b.v.**

**May 2012**



# ESSaver



.NET FuZe Home Downloads Nieuws Contact Support Rapport Product showcase

Start - Home

Logout

- Frank van Bokhoven (owner) and Jarno Bloem
- Energy Software Solutions
- ESSaver (monitoring/saving PC)
- ESSaver PUE (datacenter proces monitoring)
- Pilot Fujitsu
- Results



Monitor



Save



Consolidate



Green IT

## ESSaver Process Power Monitor

Data Sheet: ESSaver Process Power Monitor (PDF)

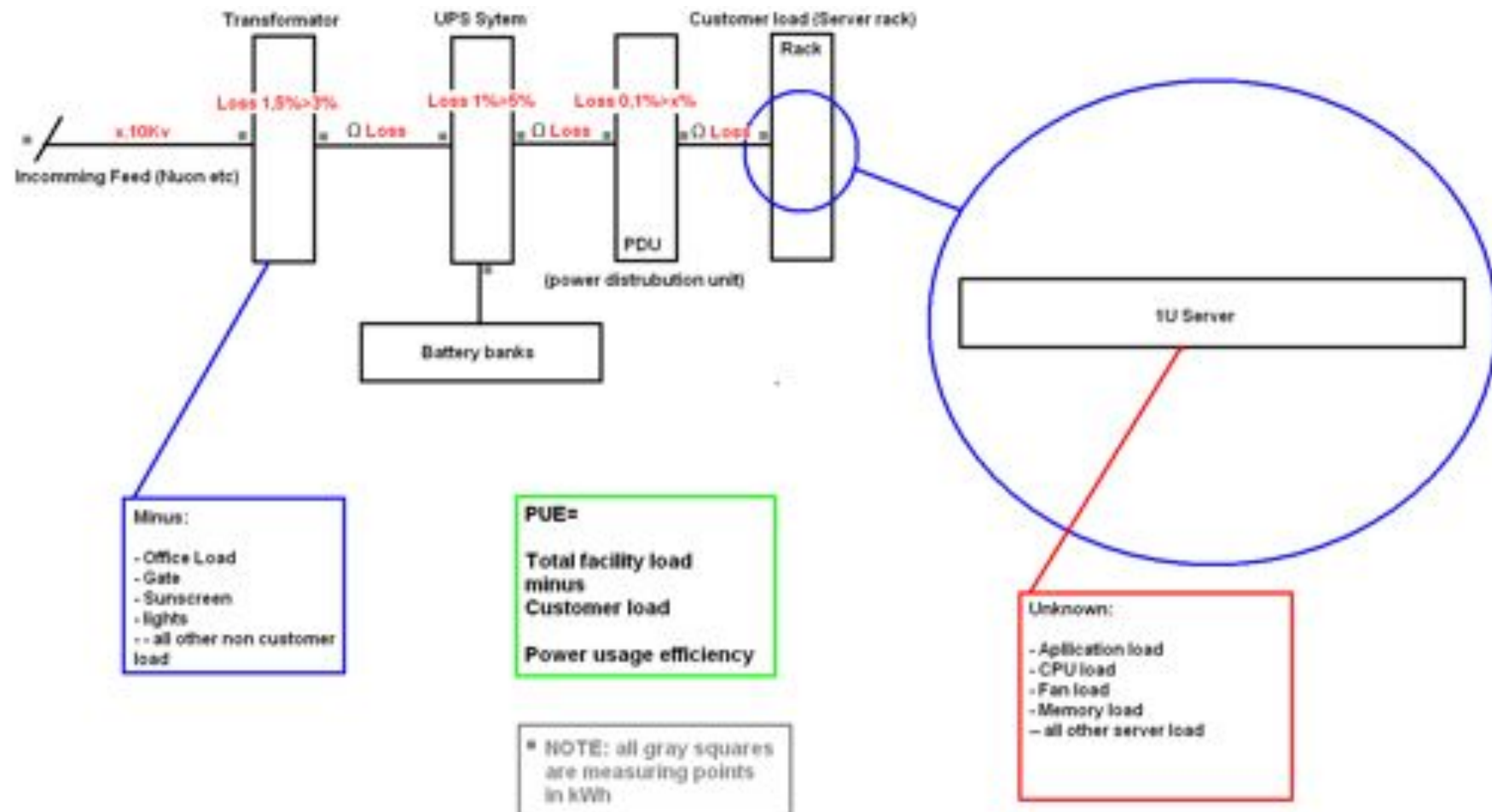
Monitor the power usage of the processes of all devices which are connected to the network. ESSaver Process Power Monitor makes this possible for all devices in your datacenter. You can manage the power usage of your datacenter.

## ESSaver Top 10:

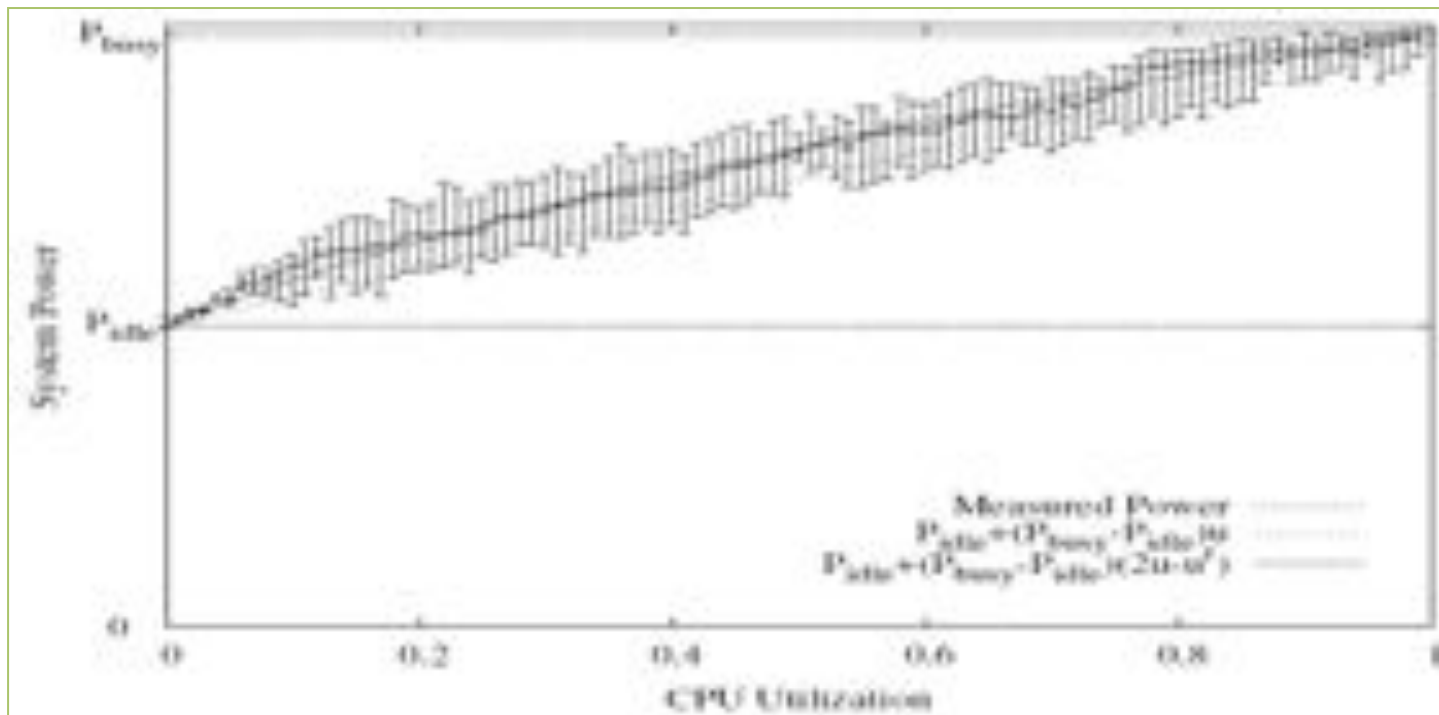
ESSaver Top 10: The world's most powerful energy monitoring software solutions. Monitor energy usage for every server in your datacenter using software only! Using ESSaver's patented monitoring method, software automatically calculate PUE and DCiE.

- What we have recognized was that there was no tool that could measure an application.....
- The whole energy chain is measurable except for the server application part.
- This left the In-house Datacenter`s with an gap.
- Never before someone could tell you what the usage on a server was per application or server part like Memory, CPU, NIC, fan etc.









Xiaobo Fan, Wolf-Dietrich Weber, Luiz Andre Barroso (Google), *Power Provisioning for a Warehouse-sized Computer*, ISCA '07



•**Reporting on:**

- Gives a report of all applications and hardware en reports this in kWh, watt or Euro.
- Consolidation of servers (capacity planning)

•**How:**

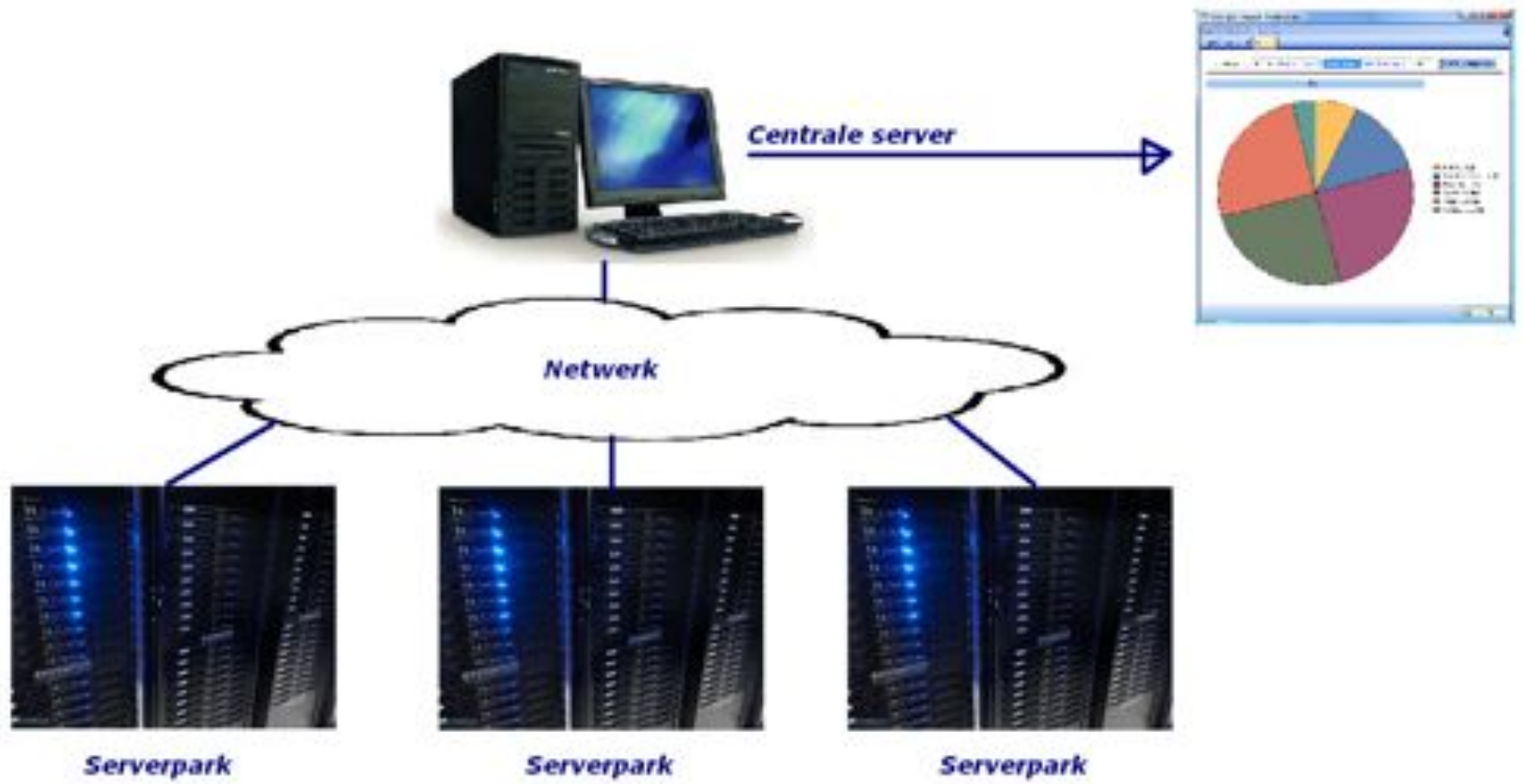
- The tools follows all processes on the server and calculates this into an accurate usage (<1% fault margin).
- The tool reports this to a central server
- Installation via several methods



# Fujitsu pilot results

- Number of servers, Windows Server 2003, Windows Server 2003 SP2,
- Reporting period january 2012 till april 2012
- Only results for 1 server.
- Lessons leared :
  - \* Logging mechanism (eventlog)
  - \* Framework issues
  - \* Push or pull for logging agent.
  - \* User account management (use windows service instead of normal winforms)
  - \* Test servers must have something to do!
  - \* One application can have multiple processes







Event Viewer

Action View Help

Event Viewer (Local)

- Custom Views
- Windows Logs
  - Applications and Services Logs
    - ESSaver
      - ESSaverHardware
      - Hardware Events
      - Internet Explorer
      - Key Management Service
      - Media Center
      - Microsoft
        - Microsoft Office Diagnostics
        - Microsoft Office Sessions
        - Microsoft-SQLServerData
        - PreEmptive
        - Windows PowerShell
        - Subscriptions

ESSaver - Number of events: 6,006 [ ] New events available

Level	Date and Time	Source
Information	8-5-2012 13:41:38	ESSaverPUService
Information	8-5-2012 13:41:38	ESSaverPUService
Information	8-5-2012 13:41:38	ESSaverPUService
Information	8-5-2012 13:41:38	ESSaverPUService
Information	8-5-2012 13:41:38	ESSaverPUService
Information	8-5-2012 13:41:38	ESSaverPUService
Information	8-5-2012 13:40:38	ESSaverPUService
Information	8-5-2012 13:40:38	ESSaverPUService
Information	8-5-2012 13:40:38	ESSaverPUService
Information	8-5-2012 13:40:38	ESSaverPUService
Information	8-5-2012 13:39:38	ESSaverPUService
Information	8-5-2012 13:39:38	ESSaverPUService
Information	8-5-2012 13:39:38	ESSaverPUService
Information	8-5-2012 13:39:38	ESSaverPUService

Show telemetry for this Server  
PUE / DCiE reporting for this Server

Event 0, ESSaverPUService

General Details

```
ESSaverData:201.20508134038(1.29870)essaverpue-management.vhost.exe(39432)(0.0299681295)(111.6250.00000074)(0.000000020)
0.000000000000000000
```

Log Name: ESSaver  
Source: ESSaverPUService  
Event ID: 0  
Level: Information  
User: N/A  
OpCode:  
More information: [Event Log Online Help](#)

Logged: 8-5-2012 13:40:38  
Task Category: None  
Keywords: Classic  
Computer: FrankYggdrasil

Actions

ESSaver

- Open Saved Log...
- Create Custom View...
- Import Custom View...
- Clear Log...
- Filter Current Log...
- Properties
- Find...
- Save All Events As...
- Attach a Task To this Log...
- View
- Refresh
- Help

Event 0, ESSaverPUService

- Event Properties
- Attach Task To This Event...
- Copy
- Save Selected Events...
- Refresh
- Help

5 events from log.

# Load test servers

- BOINC (Grid computing)
  - + Dependable
  - + Lots of loads
  - + IO / Memory / CPU



This computer is helping science with



boinc-berkeley.edu

## Reports usages.

Aggregations for : Entire datacenter, one customer, one server, per process

The screenshot shows the 'Usages' application window. At the top, there are dropdown menus for 'Datacenter' (Yggdra (Amhemseweg 39)), 'Client' (Yggdra), and 'Server' (19, Yggdra (Amhemseweg 39), Yggdra, Dell Poweredge 1810, 192.168.1.50). The 'Contactperson' is listed as Frank van Bokhoven / frankvanbokhoven@ygg.

Under 'Report options', the 'Usage report per Process per CPU/Mem./Fan per day' is selected. The 'Period from' is 'vrijdag 6 april 2012' and the 'Period until' is 'donderdag 8 mei 2012'. A 'Fields in report' list includes Datacenter, Client, Contact person, Period from, Period until, Server, IP, Server description, kWh, Carbon, Euro, and FUE. A 'Refresh' button is located to the right of this list.

The 'Results' section displays a table with the following data:

ProcessName	MemoryUsage	MemoryUsed	CPU_KWH	Carbon	Euro	DayNumber
firefox.exe	9.104192E-05	9.10419225632749E-05	0.1175	8.600000001	1.999999987	127
sqlservr.exe	4.383376E-05	4.38337605446577E-05	0.3525	2.580000000	5.999999963	127
system.exe	7.904E-07	7.90400023106486E-07	0.47	3.440000000	7.999999951	126
boincscr.exe	0.0041708252800000	0.0041708253268393	41.2801000099182	0.000300680	7.039999957	127
openmaliab_6_58_windows_intel	0.27999848864	0.279998489320278	241.986850018311	0.001770960	4.120999974	128
vmprise.exe	0.0190212374400002	0.0190212374334224	246.977950012207	0.001805870	4.208999974	128
openmaliaa_6_58_windows_intel	0.2276800248	0.22768002485309	565.697875026703	0.004137330	9.630999941	128

At the bottom right, there is an 'Export to file...' button with a 'select' dropdown menu.



## Usage figures (Excel report)

Report per CPU/Mem/Fan (Reported period: vrijdag 6 april 2012/dinsdag 8 mei 2012)							
ProcessName	MemoryUsage	MemoryWatt	CPU_KWH	Carbon (kg CO2)	Euro (€)	DayNumber	
boincscr.exe	0,00	0,00	41,28	16,51204	8,25602	127,00	
firefox.exe	0,00	0,00	0,12	0,04700	0,02350	127,00	
openmalariab_6.58_windows_intelx86.exe	0,23	0,23	565,70	226,27915	113,13958	128,00	
openmalariab_6.57_windows_intelx86.exe	0,28	0,28	241,99	96,79462	48,39731	128,00	
sqlservr.exe	0,00	0,00	0,35	0,14100	0,07050	127,00	
system.exe	0,00	0,00	0,47	0,18800	0,09400	126,00	
vmiprvse.exe	0,02	0,02	246,98	98,79118	49,39559	128,00	



## Load graph



# Conclusions

- ✓ Wishes and requirements for product development have been identified
- ✓ Innovative product that is not yet available.
- ✓ There is a reasonably simple way to make great changes throughout the data centre market (In-house / Commercial DC`s)
- ✓ The tool can play a major role in the cloud, the new way of billing for usage
- ✓ Savings by capacity planning.
- ✓ Also it is easier to Trouble shoot

Know for every process kWh, NIC IO and kWh, PUE, DCIE, PPue

**ESSAVER PUE ENERGY REPORT**

Tata  
1675 LaSalle  
Suite 510  
Denver, CO 80202  
United States

Datacenter:  
Site:  
# servers monitored:

Tata  
Site 1  
1000

Usage overview		Metrics
Total energy usage all servers (kWh)		1243234 kWh
		6453208 kg CO2
		43452,32 €
PUE (all servers)		2,24
DCIE (all servers)		89%
FLOPS		30 MFLOPS/Watt

Usage overview per application (19 january 2011 – 23 september 2011)		Metrics
DS.EHE		23432,43 kWh
		543432 kg CO2
		3423 €
		PUE: 1,54
		DCIE: 92%
WONGRELEHE /SOC /ES		232342,3 kWh
		32321 kg CO2
		50300 €
		PUE: 1,34
		DCIE: 79%
SQLAGENT.EHE		10211 kWh
		34219 kg CO2
		9023 €
		PUE: 1,45
		DCIE: 85 %

Page: 1 of 1    Words: 77    English (United States)    30%

- Vragen



**Frank van Bokhoven | Energy Software Solutions B.V.**  
Arnhemseweg 39, 6991DK Rheden | **I** [www.energysoftwaresolutions.nl](http://www.energysoftwaresolutions.nl)  
**T** (0031) 26 3706499 | **M** 06 48109250 | **E** [frankvanbokhoven@energysoftwaresolutions.nl](mailto:frankvanbokhoven@energysoftwaresolutions.nl)