



**CleanVisio**  
THE POTENTIAL OF ENERGY

Digital building services

Presentation 10/2018

# ENERGY AUDIT (TRADITIONAL METHOD)



Buildings account for over 40% of global energy consumption (UN) in Singapore energy usage is over 30% of total amount



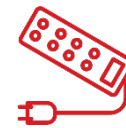
Fossil energy prices are increasing in long term and more CO2 is released to climate every day



Existing buildings need to become smarter in use of energy



Big partition of energy is wasted when spaces are not occupied or cant be adjusted according to number of users

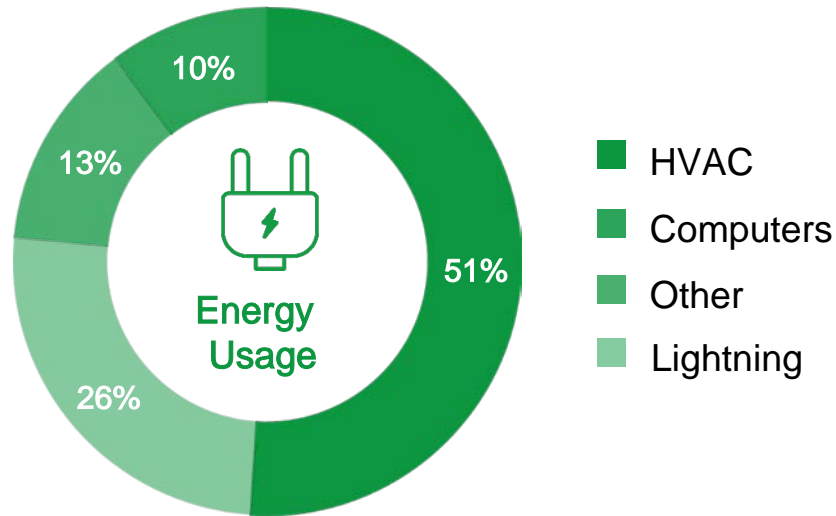


Usually plug loads are always on and cant be controlled



First step on energy retrofit is to know where energy is being used

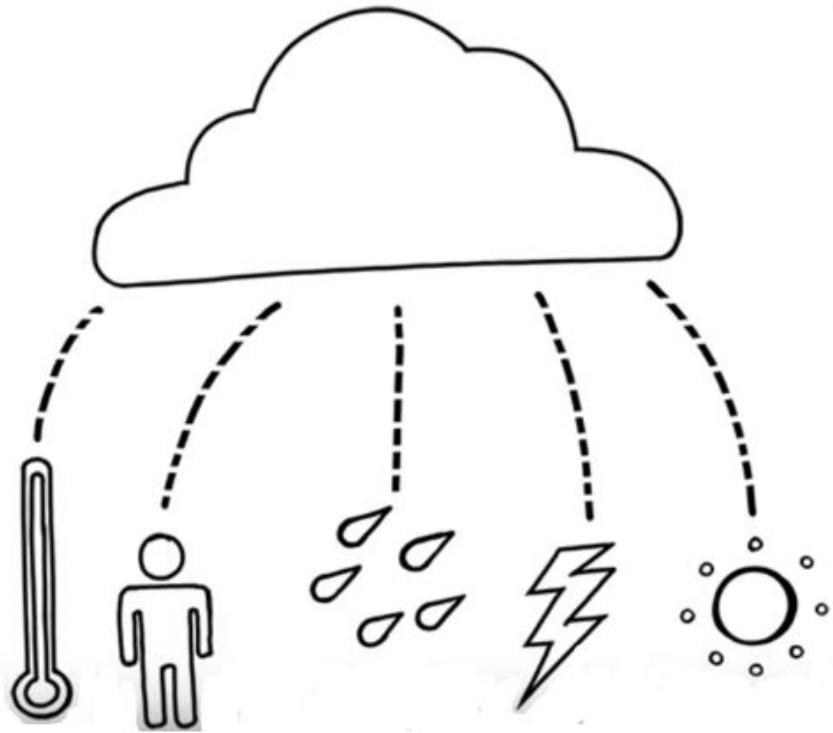
# ENERGY AUDIT (TRADITIONAL METHOD)



Typical way of starting new energy conserving retrofit is to define present state of energy usage by using services of energy auditor .



Energy auditor measures current usage or longer period with logging meters, evaluates where savings could be found (usually more efficient HVAC equipment and control), counts evaluated savings in different sectors and compares savings to costs of retrofitting .



We use sensors and cloud computing for finding every energy conserving measure and combine them into economically viable retrofitting plan .



### Commercial and own production set of sensors

Sensors map precisely where and when energy is being used and recognizes what devices are on, also one can see how many people are present in different spaces at the moment or check utilization rate from trend log

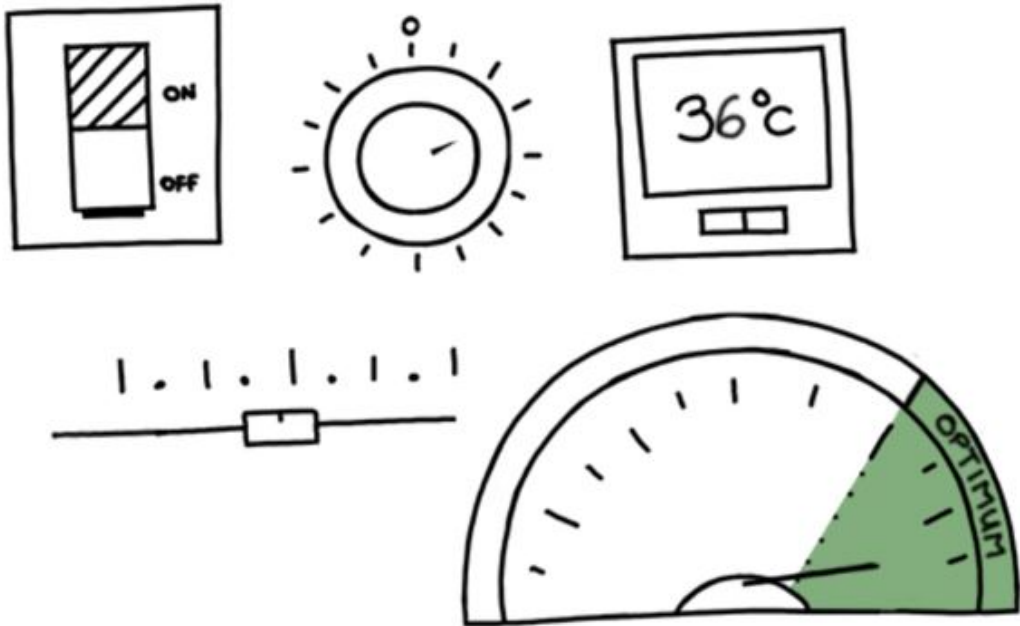


Buildings normal maintenance personnel are suitable for installing and programming sensors as it doesn't require any special skills.



### Energy audition mobile application

Application sends basic building data straight to cloud computing including measures and air flow of different spaces, etc also sensor programming is done easily so that cloud platform is readable right away.



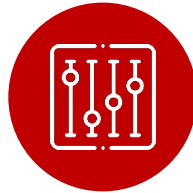
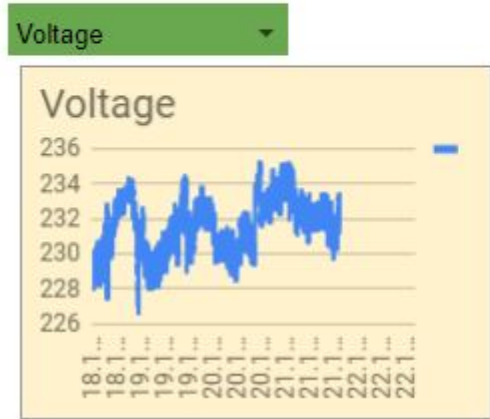
With sensors installed it is possible to monitor energy consumption and usage of individual spaces, also including air quality monitoring .



**Cloud calculation of all possible saving options**  
Software calculates energy waste usage by each spaces and plug loads that consume energy in stand by mode

# HOW WE DO IT

Actual voltage	Actual people present	Temperature	Humidity	Group	Power
230,4	0	22,42		35,9 Lighting group 1	119,5
				Lighting group 2	125,2
				AV Equipment	63
				Socket group 1	99,9
				Socket group 2	119,2



Multi objective calculation for best combination of savings (in development)



Platform is ready for variety of new programs (e.g. for maintenance or for creating a digital twin from building)



Clean Visio provides total solution for energy monitoring accuracy of single device level



Counting amount of persons in individual spaces (passive counting, no images, no register)



Indoor climate monitoring, °C,RH,CO2,VOC



Energy modeling, automatic calculation of energy wastage

Compatible with **BCA Green Mark certificate**, with following features:

- ✓ Automated control of lighting levels with individual occupancy knowledge
- ✓ Active plug load management based on occupancy and overnight equipment management system
- ✓ Adaptive air -conditioning and ventilation by number of persons in individual spaces
- ✓ Occupant comfort (various settings)
- ✓ Indoor contaminant management (add on feature)
- ✓ Improvements on energy efficiency index
- ✓ Energy portal and dashboard





## For end users

- Fresh and healthy working conditions
- Increased effectiveness at work or study
- Possibility for easy individual settings (optional)
- Possibility to set own goals on energy use with tenant portal (optional)



## For building owners

- Maximize the effective use of different spaces
- Lower the costs of energy and maintenance
- Control energy usage by hourly prices
- Run smart software with data analytics



## For energy companies or HVAC contractor

- Ability to control load in buildings (Demand response)
- Better predictions of loads with building analytics
- Energy inspections made easy
- Indoor conditions as a service

# Our staff

Founded : 2016  
Founder : Heikki Kalliokoski (100% owner)



Heikki Kalliokoski  
Founder



Emilia Valli  
Office



Roope Uusitalo  
Technician



Jaakko Auvinen  
Sales manager



Terho Kuosmanen  
Software developer



# THANK YOU!