



Engineering Better Energy Solutions



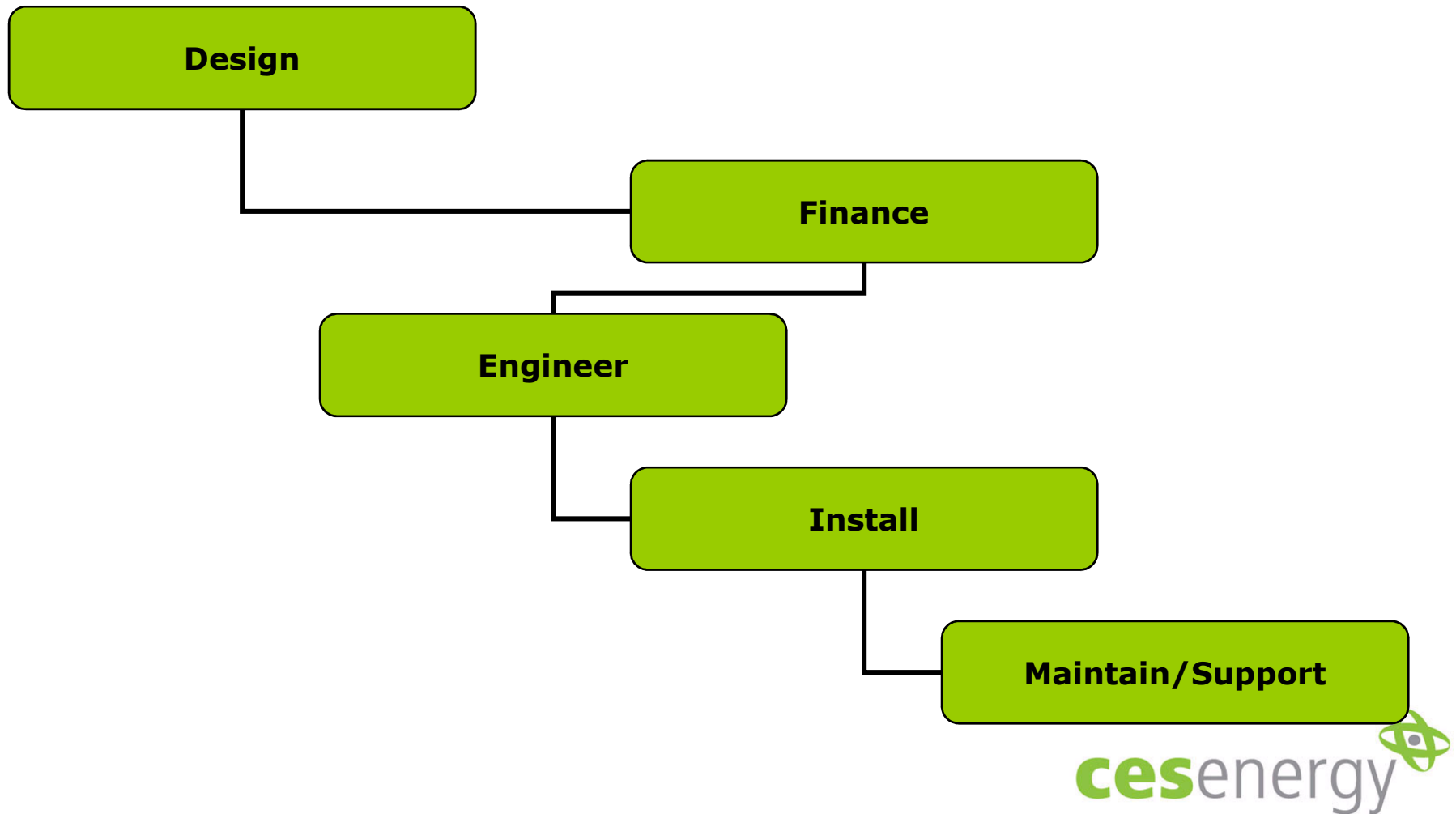
4th April 2008

Our Mission Statement

“To engineer better energy solutions giving substantial financial saving and reducing CO2 emission”

- *CHP*
- *TRI-Generation*
- *District Heating*

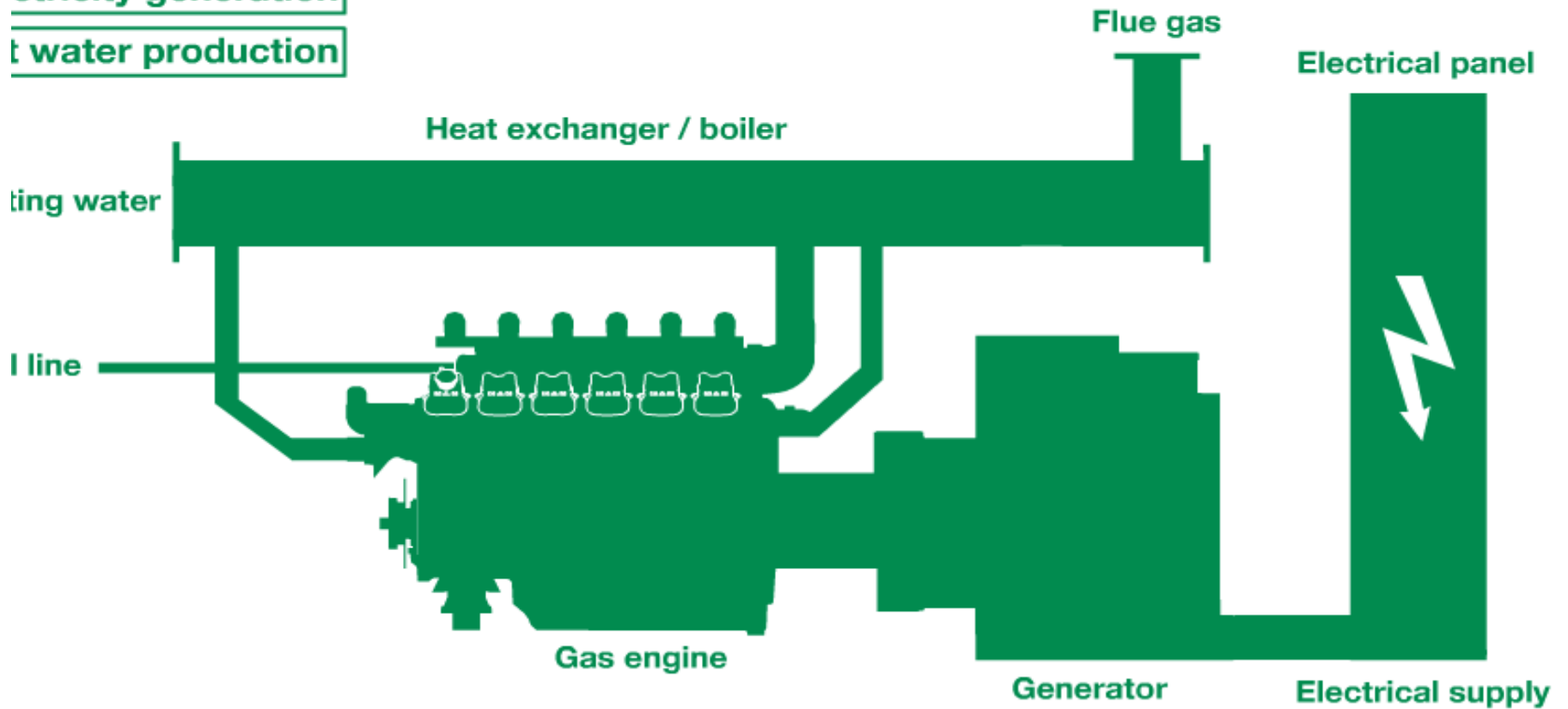
Delivery model



Combined Heat and Power?

Electricity generation

Hot water production



What is Tri-generation?

Tri-generation is the simultaneous generation of the three primary energy requirements for a building from one single fuel input.

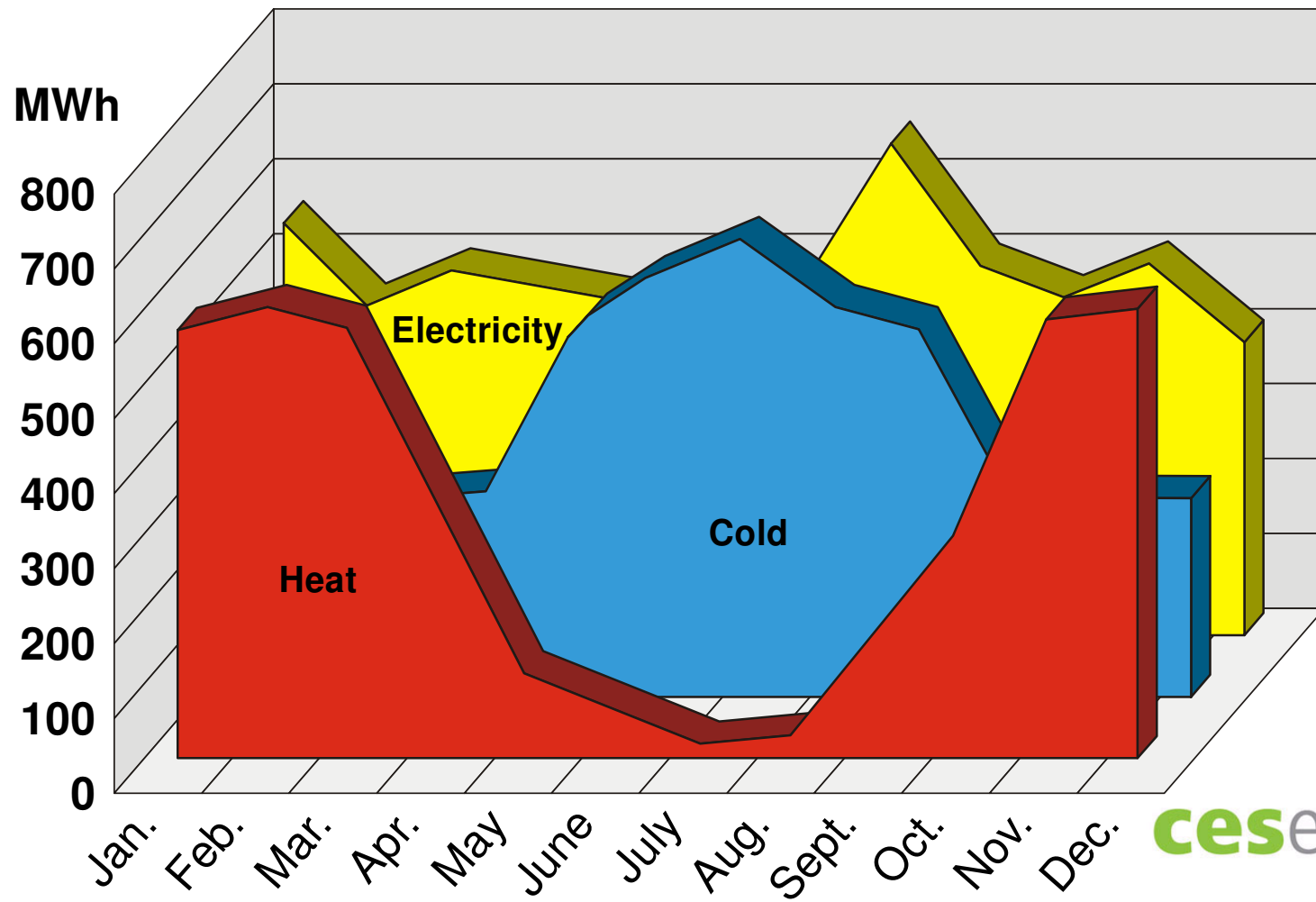
- Heat
- Cooling
- Electricity

This plant consists of these primary components:

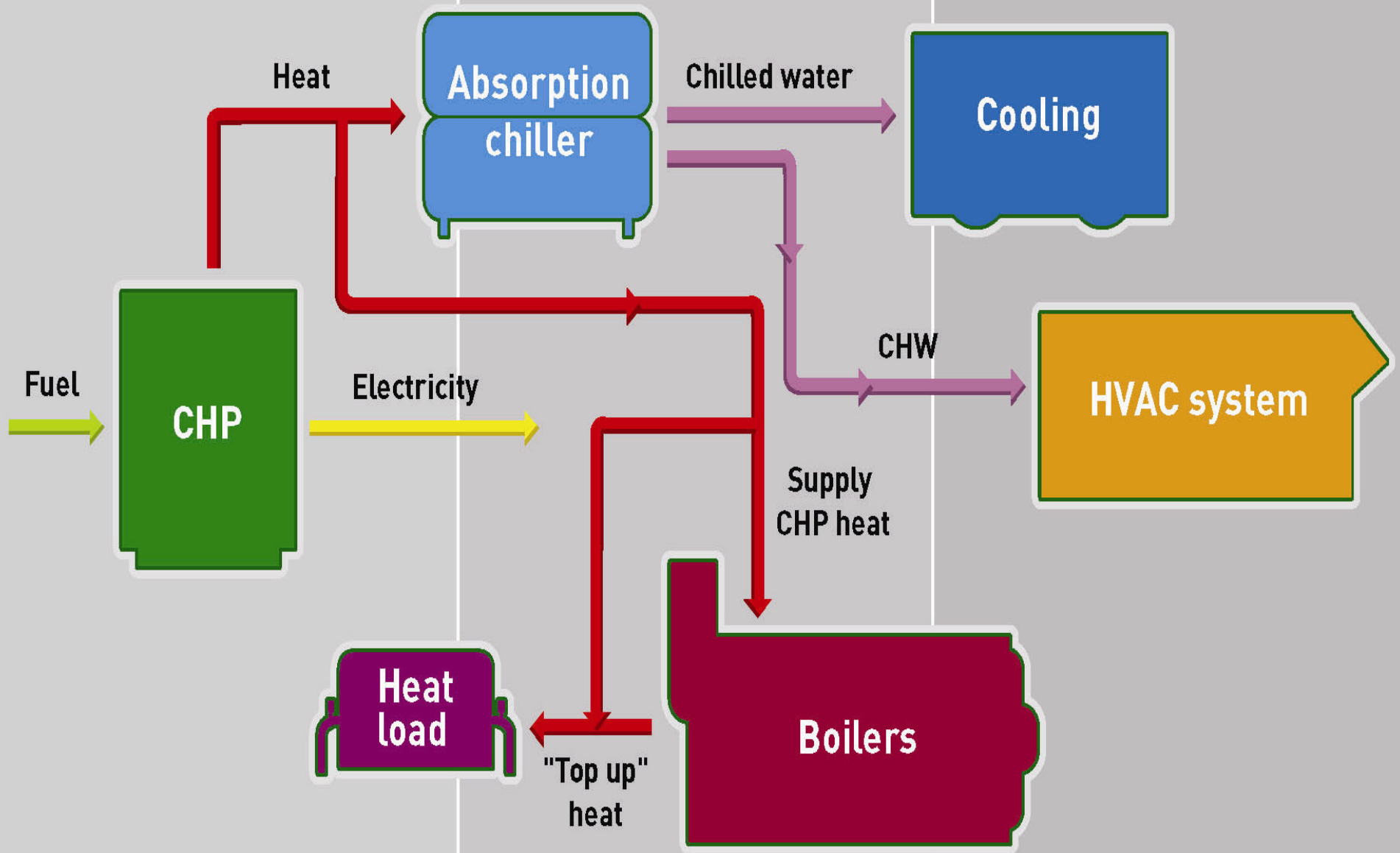
- CHP plant
- Absorption chiller
- Distribution system
- Control system
- Heat dissipation equipment

Why Tri-generation?

Annual Energy Consumption Profile – Office Block Scenario



Trigeneration



The CESenergy Solution

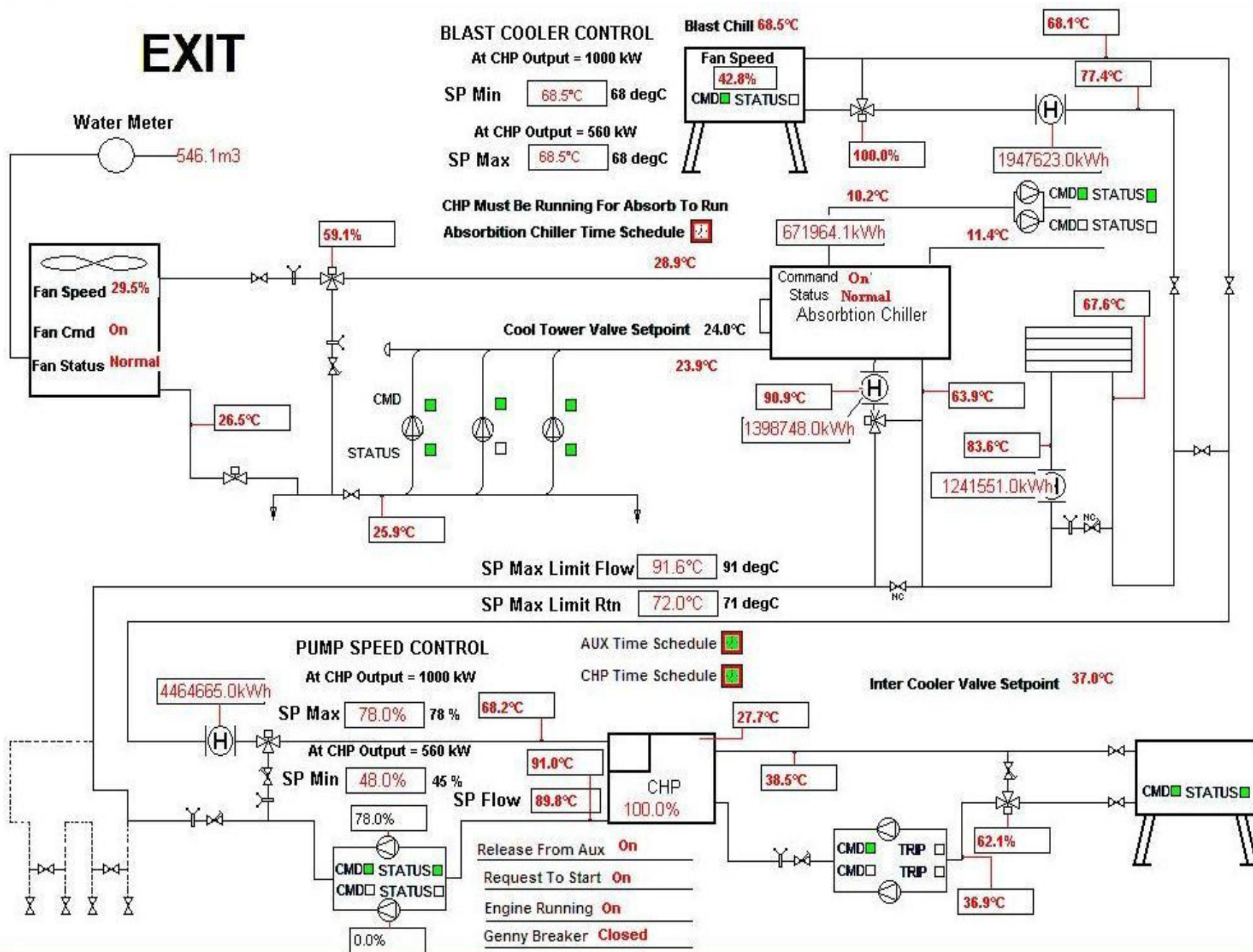
- Energy supply company (ESCo model)
 - ESCo design, build, operate, maintain and finance an on-site energy centre which delivers the lead primary energies (electricity, heating and cooling)
 - ESCo can provide energy centre and take over the full procurement of all energy requirements
 - Customer and ESCo enter a power purchase agreement with agreed energy prices
 - Fixed energy prices
 - Customer receives a single monthly energy bill from ESCo
 - No ongoing costs for customer

A & L Goodbody Case Study

- ❑ CESenergy own and operate a 1MW CHP unit
- ❑ CESenergy provide the 11,000sqm, 5 story building with its primary electrical, heating and cooling demand from the Tri-gen CHP plant
- ❑ CESenergy bill A & L monthly for all energy consumed
- ❑ No capital outlay or ongoing costs to A & L
- ❑ No back up generators required the CHP operates a complete 'black start' backup

CHP Overview 17:30

EXIT



CHP Output 17:30

Ready For Automatic Demand

Request To Start

Request Acknowledged

Request For Auxiliaries O.K.

Auxiliaries O.K.

Engine Is Running

Generator C/Breaker Closed

General Alarm

General Trip

Emergency Stop Activated

Island Mode

Auxiliaries Schedule On

CHP Schedule On

CHP Load Schedule On

Electrical Meter Day/Night On

CHP Instantaneous Output

1015.4kW

Required Power
(15 Min Interval)

393.6kW

A & L Instantaneous Usage
(minus all auxiliaries - 15 Min)

393.6kW

Required Power 0.0%

SET OFF % Load Setpoint SET 100.0%

Local Control SET Off SET 0.0%

Enclosure Temperature

27.8°C

Enclosure Fans Control

SET 25.0°C Status

SET 23.0°C Status

Heat Dump Control

	Temp	Valve
SET	70.0°C	61.5°C 100.0%

2nd Stage Intercooler Control

	Temp	Valve
SET	37.0°C	36.9°C 61.1%

Max Demand On

Max Demand

744.0kW

Reset

CHP Max Demand

525.6kW

Reset

Startup Load Time SET 1.0Min

Startup Load Setpoint SET 10.0%

A & L Goodbody Case Study

Advantages

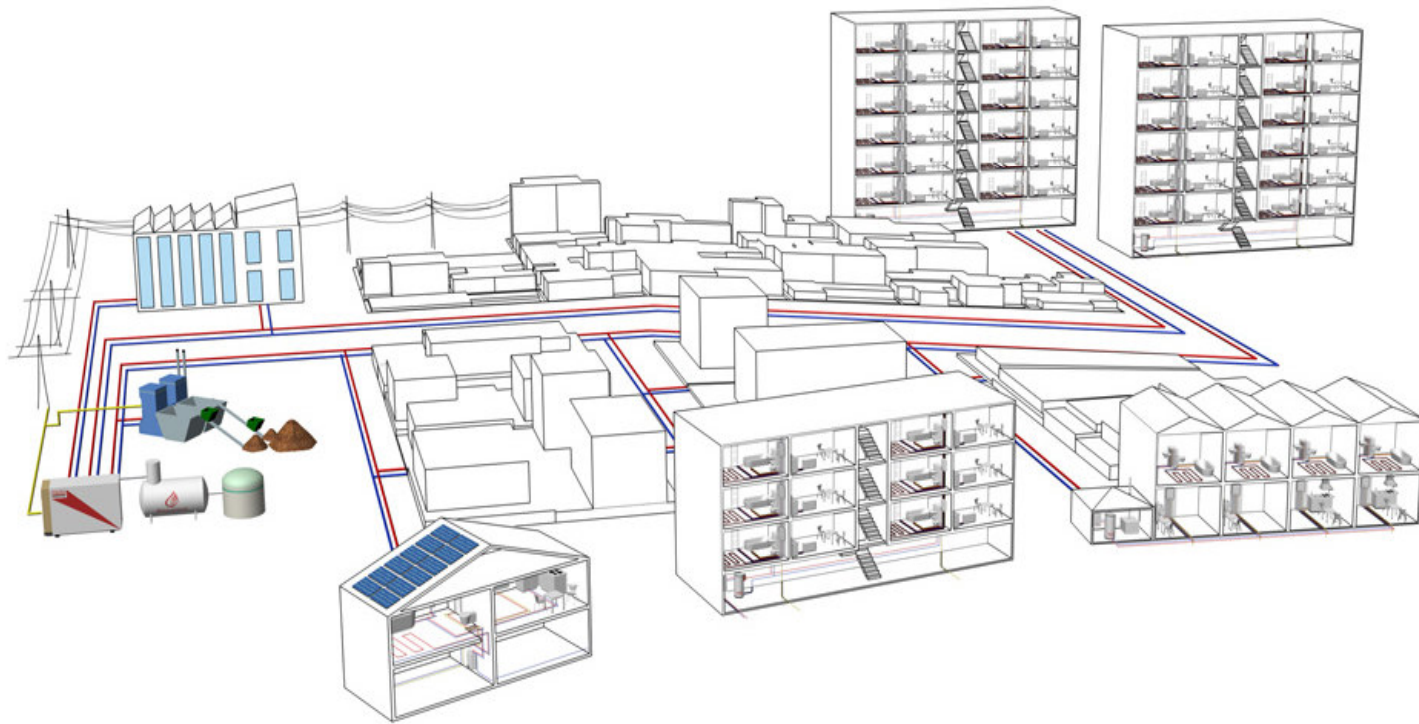
- ❑ Direct financial saving of €50k per year
- ❑ Reduce capital costs due to elimination of back up generators
- ❑ Reduced running costs of existing boilers
- ❑ In line with company ethos on environmental standard
- ❑ Well positioned for upcoming BER
- ❑ Greenhouse gas emission reduced by over 1,400 tonne per annum
- ❑ Further saving based on Carbon taxes

Benefits of CHP & Tri-generation?

- ❑ Reduced electricity costs and demand
- ❑ Reduced heating costs
- ❑ Reduced cooling cost
- ❑ Reduce CO2 emission
- ❑ In-line with company environmental policy
- ❑ Security of supply
- ❑ Positions your building now for the future standard ie. higher rating building will attract higher rent and blue chip tenant

District Heating

- Heat energy is transferred from a central energy centre (plant room) to point of use



District Heating

- ❑ CESenergy exclusive partners with Pewo (www.pewo.com) in UK and Ireland
- ❑ Pewo are market leaders in Germany, Austria and Italy in the range of District heating stations
- ❑ More than 70,000 heating stations produced
- ❑ Germany manufacturer
- ❑ ISO 9001
- ❑ Owner owned and managed

Turnkey District Heating Solution

We offer the complete design, build, operate, maintain and monitor district heating solution:

- *Energy centre*
- *Distribution Network*
- *Consumer unit*
- *CESenergy control*

Energy Centre

- Gas boilers
- Bio-mass
- CHP
- Geo-thermal
- Skid delivery/Pre-packaged plant rooms
- Layout and design

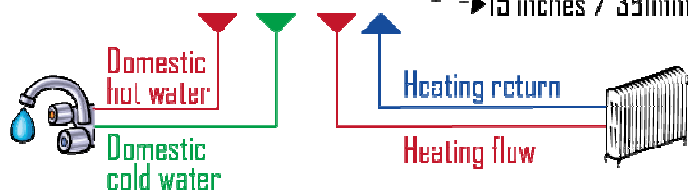
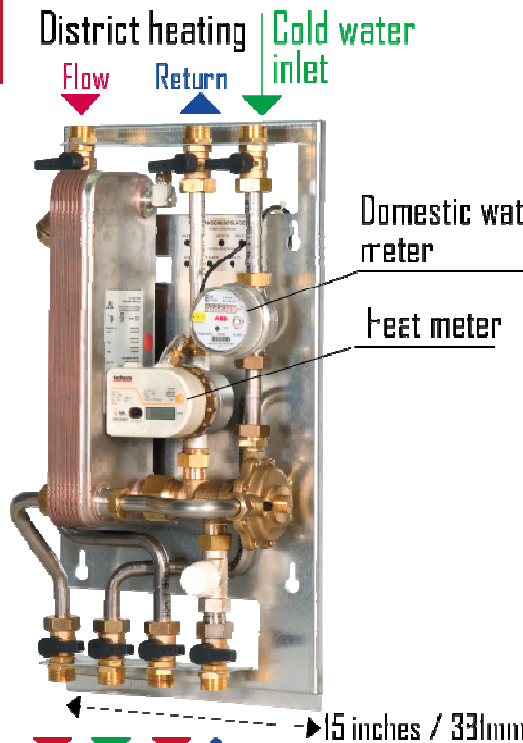
The Consumer unit - direct

pewoTherm V35 / V50
Apartment sub-station

Room temperature
regulator

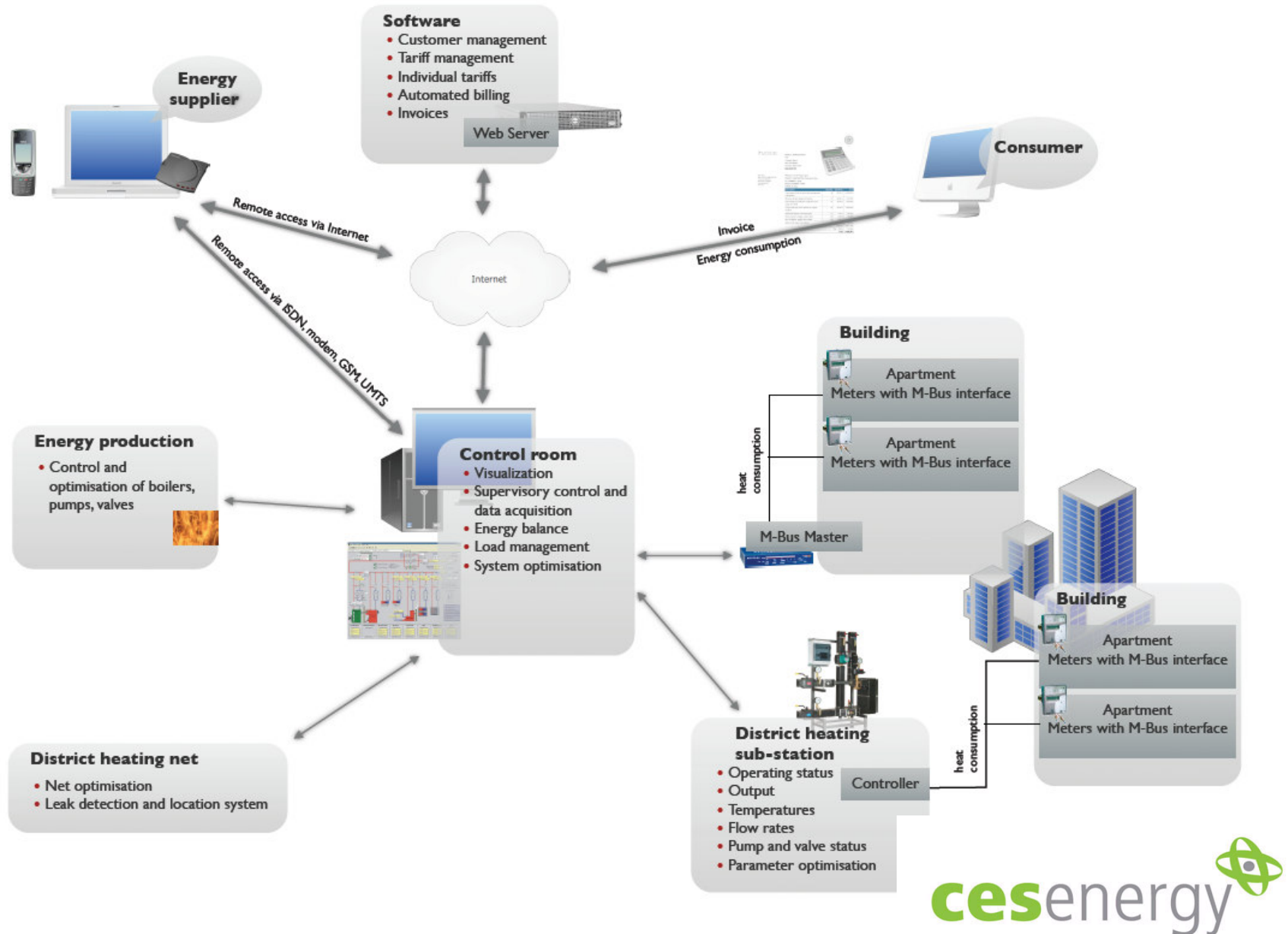


21.8 inches / 553 mm



- Self-contained system in a single housing
- Wall mountable
- Silent operation
- All devices and control elements accessible by front
- Plate heat exchanger lagging
- No auxiliary electrical power required
- Quick installation

CESEnergy control



Why CESenergy?

- ❑ **Specialist in CHP, Tri-generation and DH solutions** - team of experienced and qualified engineers
- ❑ **Complete in house installation**
- ❑ **CESenergy control** – maintenance, management, 24/365
- ❑ **Grants** – advise and application
- ❑ **Experienced Project management** –design, build, operate and maintain
- ❑ **Flexible finance solutions** – ESCo and D/M models