

PROYECTO MPC HYBRIDGEOTABS



✓ GEOTER

GARANTÍA, CONFIANZA Y SEGURIDAD en el diseño de instalaciones geotérmicas para calefacción, refrigeración y agua caliente sanitaria.

✓ SERVICIOS

EQUIPO ALTAMENTE CUALIFICADO DE INGENIEROS Y TÉCNICOS para diseñar y ejecutar el diseño, monitorización y plan de mantenimiento de todas las instalaciones.

✓ PROYECTOS

VOCACIÓN DE SERVICIO en cada uno de los nuevos edificios o de rehabilitación para asegurar el éxito.

✓ INVESTIGACIÓN, DESARROLLO E INNOVACIÓN

Experiencia en proyectos nacionales e internacionales asegurando una dedicación basada en la EXCELENCIA y la transferencia de tecnología desde la investigación a la explotación de resultados.

✓ PRODUCTOS

Alianzas estratégicas con los principales fabricantes europeos para el desarrollo de equipamiento, sistemas y soluciones.

✓ SISTEMAS HÍBRIDOS

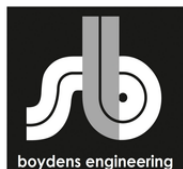
Diseño, optimización, desarrollo y experiencia en la integración de energías renovables y recursos.

✓ PRESENCIA INTERNATIONAL

Alianza estratégica con equipo propio en Argentina, Chile, Colombia, Bolivia, Mexico y Perú.



CONSORCIO



The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723649. The original project acronym is "MPC-.GT".



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Controlling the power of the ground by integration



CONCEPTO GEOTABS

TABS

Thermally Activated
Building System
(sistemas termoactivos)



GEO

Geotermia de baja entalpía
A través de bomba de calor



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TABS

- Calefacción y refrigeración radiante
- Alto confort térmico
- Alta inercia térmica
- Acumulación térmica, suavizar picos
- Baja temperatura calef. (24°C-28°C)
- Alta temperatura refrig. (16°C-21°C)

GEOtermia

- Energía renovable
- Uso de energía sostenible
- Fuente de baja temperatura (8°C-15°C)

BOMBA DE CALOR

- Baja ΔT
- Alta eficiencia térmica
- Passive cooling





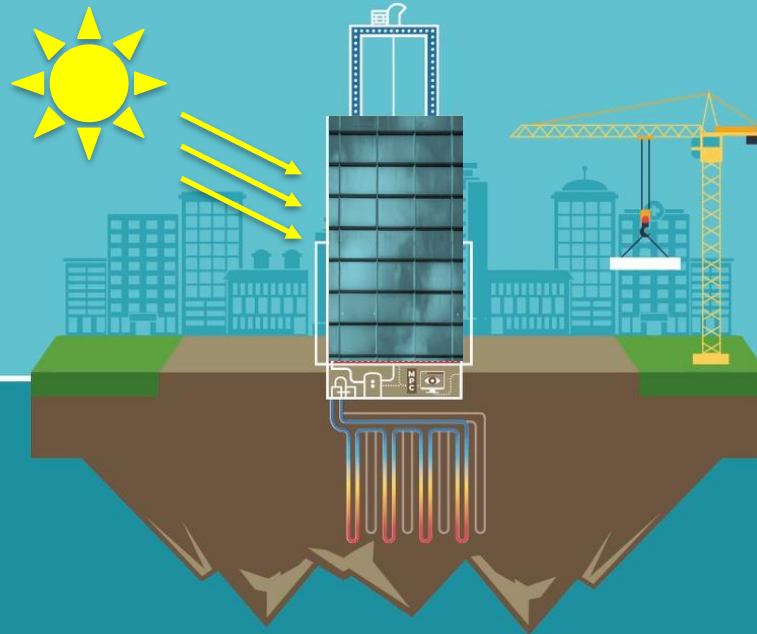
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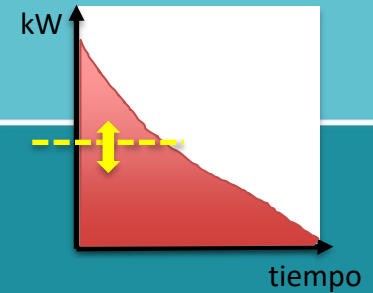
TABS

- Alta inercia térmica
- Cambios intradiarios
Calefacción ↔
Refrigeración?



GEOtermia

- Viabilidad técnica
- Viabilidad económica





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TABS

- Alta inercia técnica
- Cambios intradiarios
Calefacción ↔
Refrigeración?
- **Sistemas secundarios
de distribución térmica
de reacción rápida**
- **Control optimizado
Control MPC**

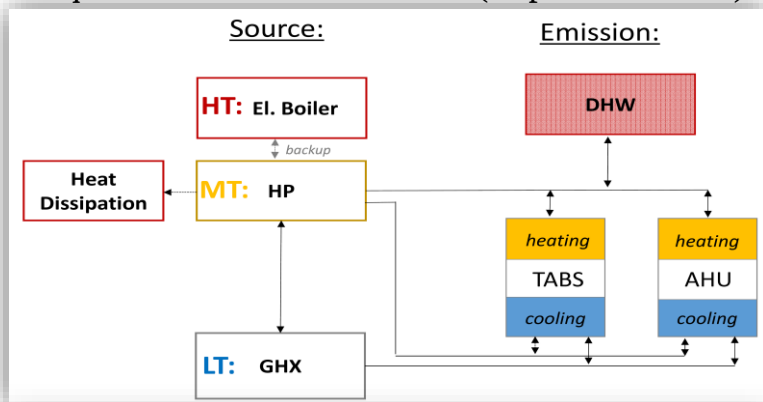
GEOtermia

- Viabilidad técnica
- Viabilidad económica

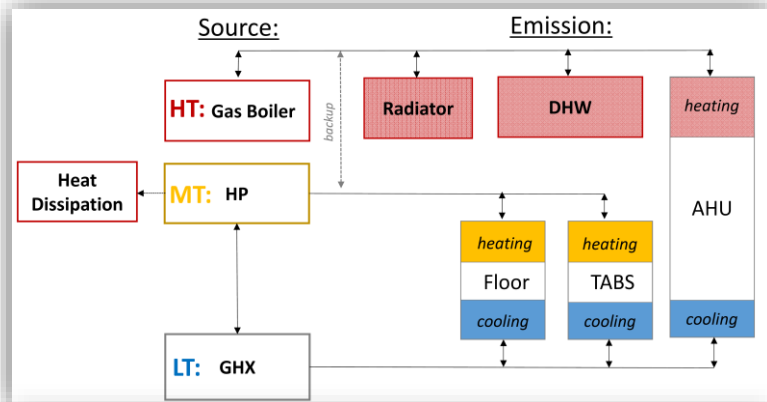
Fuente secundaria de energía



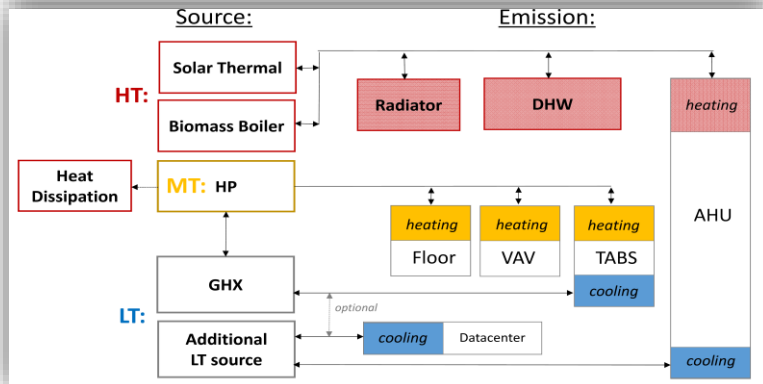
1. Esquema escuela de Libeznice (República Checa)



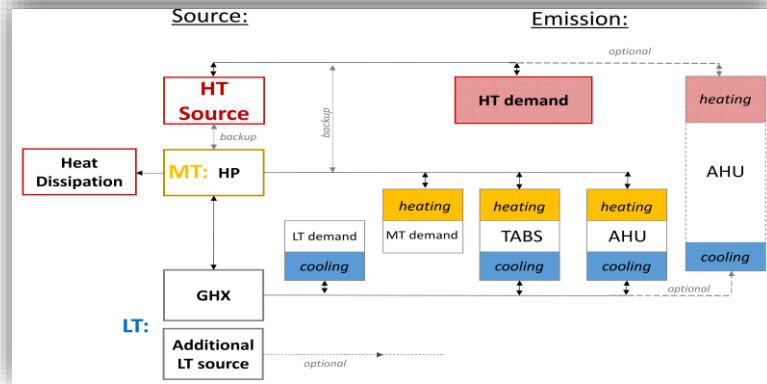
2. Esquema de Ter Potterie (Bélgica)



3. Esquema de Solarwind (Luxemburgo)

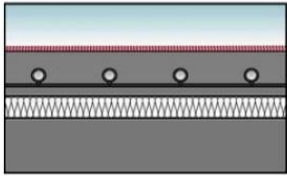


4. Esquema de edificios hybridGEOTABS

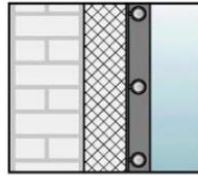


SISTEMAS RADIANTES FRÍO CALOR

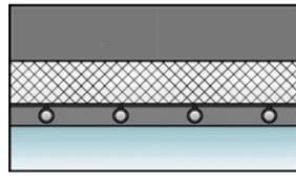
Floor



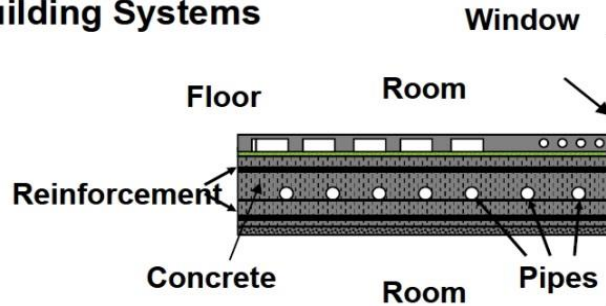
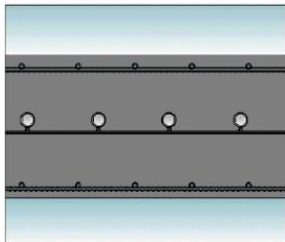
Wall



Ceiling



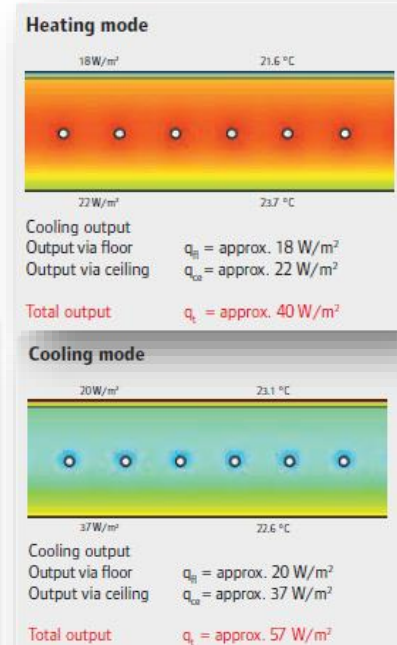
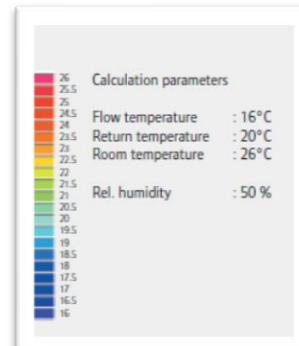
Thermo Active Building Systems

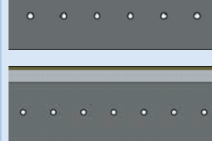
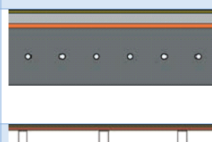
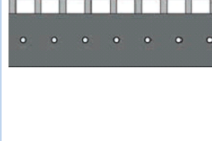


- Calefacción y refrigeración
- Máxima superficie radiante
- **Alto confort térmico y calidad del ambiente interior**
- Distribución uniforme de temperatura
- Disminución de corrientes de aire
- Operación silenciosa
- Aumento de altura de las estancias
- Flexibilidad y aumento de espacios

TABS - SISTEMAS TERMOACTIVADOS EN EDIFICIOS

- Muy baja temperatura (16-28°C) sobre toda la superficie
- Alta inercia térmica del sistema de emisión
- Acumulación térmica en el edificio
- Suavizar picos de funcionamiento



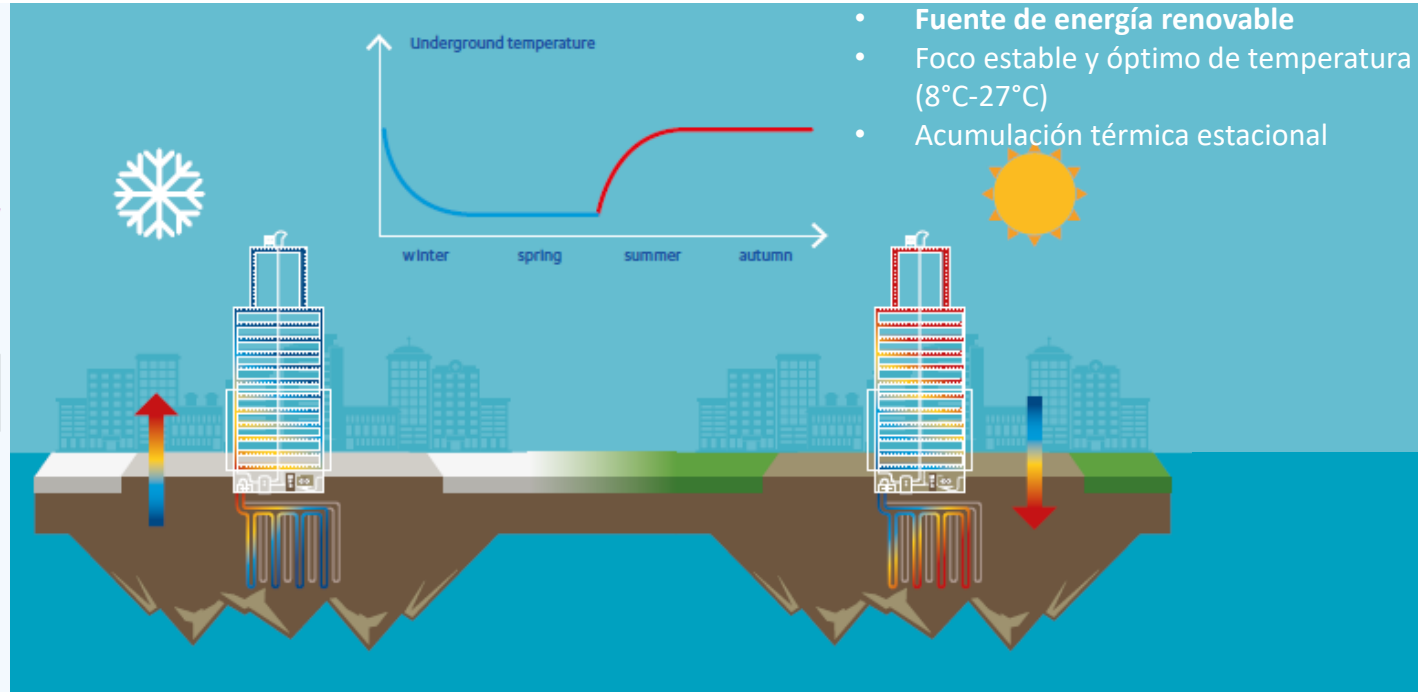
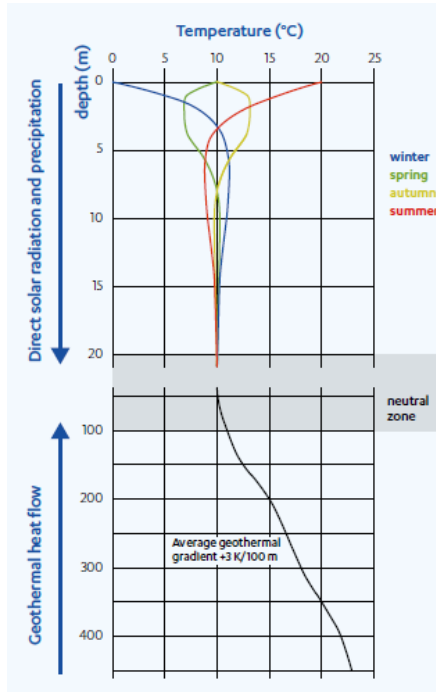
Slab type	Structure	Optimal application of TABS
Concrete slab with or without bonded screed		Concrete slabs with only a thin floor covering or bonded screed deliver heating and cooling into the room
Concrete slab with sound insulation		Sound insulation reduces output via the floor. This design option is acceptable in applications where mainly the effect of cool ceilings is utilized.
Concrete slab with raised floor		For a raised floor, the same considerations apply as for a floor with sound insulation. This type of ceiling construction is popular because power supply and cables can be installed in the void.
Concrete slab with hollow floor		Another variant that is frequently used in office buildings is the hollow floor construction. In terms of performance, it behaves similarly to the raised floor. However, because screed (instead of floor panels) is used, inspection openings have to be used for the underfloor installations.



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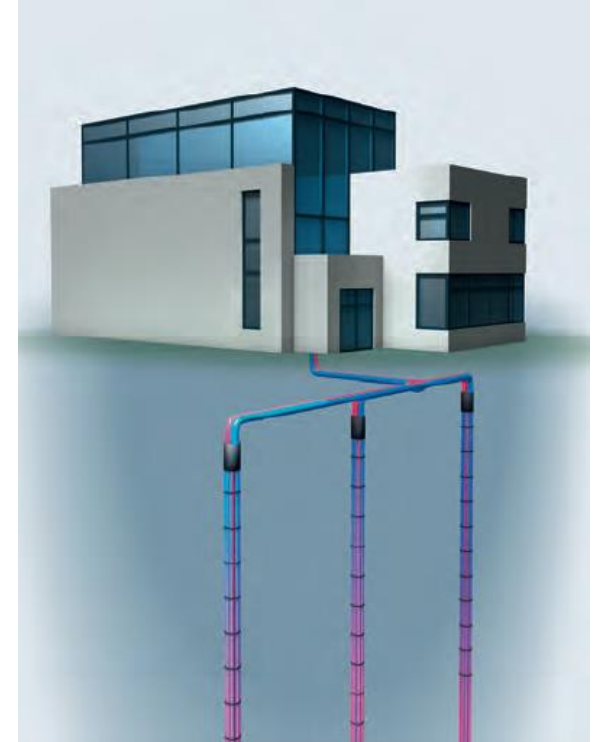
ENERGÍA GEOTÉRMICA



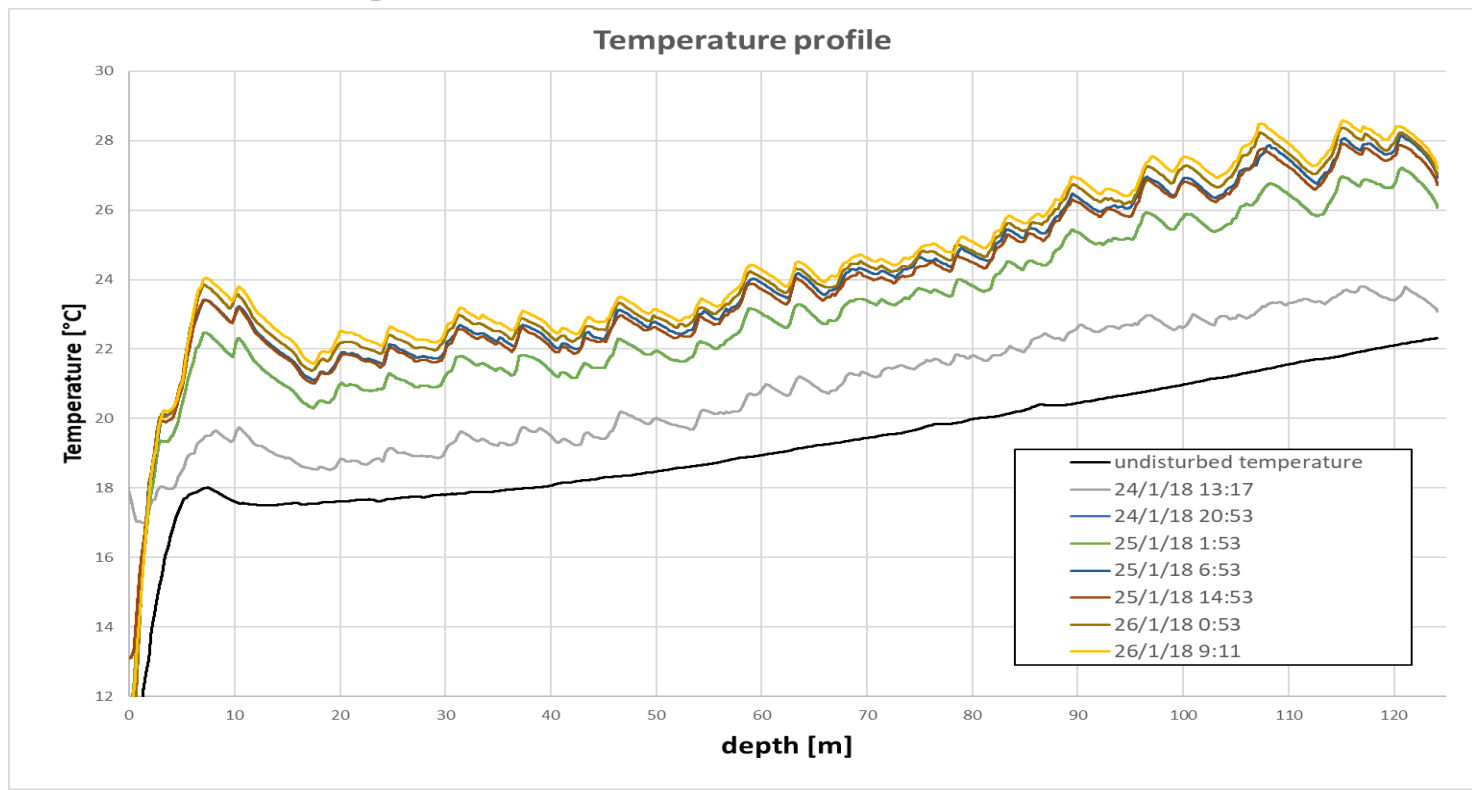
Análisis del recurso geotérmico

Intercambiador geotérmico – Diseño & Operación

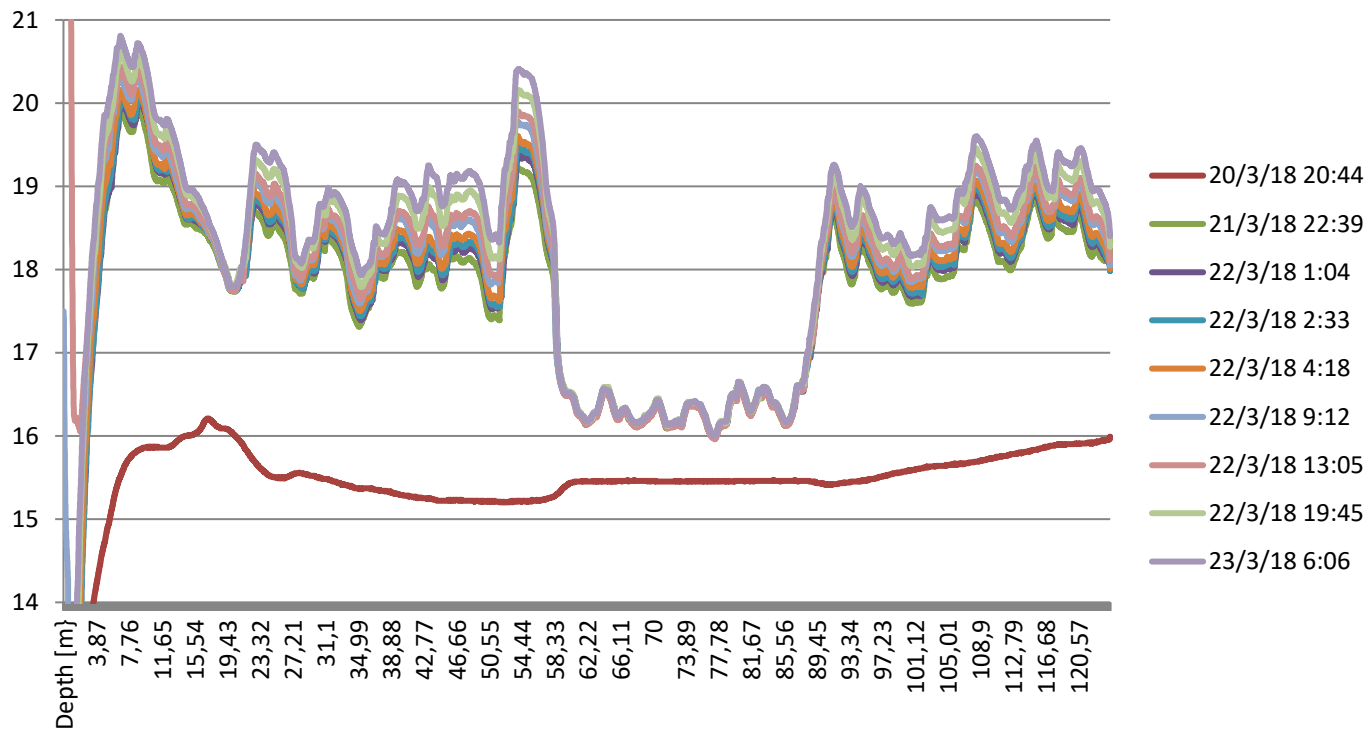
- Desarrollo de Test de Respuesta Geotérmica Mejorada para la obtención de perfil de temperatura, conductividad térmica. Monitoreo continuo de las sondas geotérmicas.
- Permite la optimización del dimensionamiento del campo geotérmico y proporciona los datos necesarios orientados al controlador MPC para decidir la mejor gestión térmica del edificio.



Perfil de temperaturas - Madrid



Perfil de temperaturas - Asturias





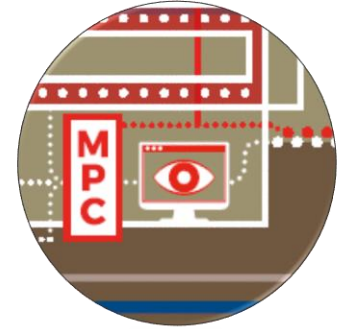
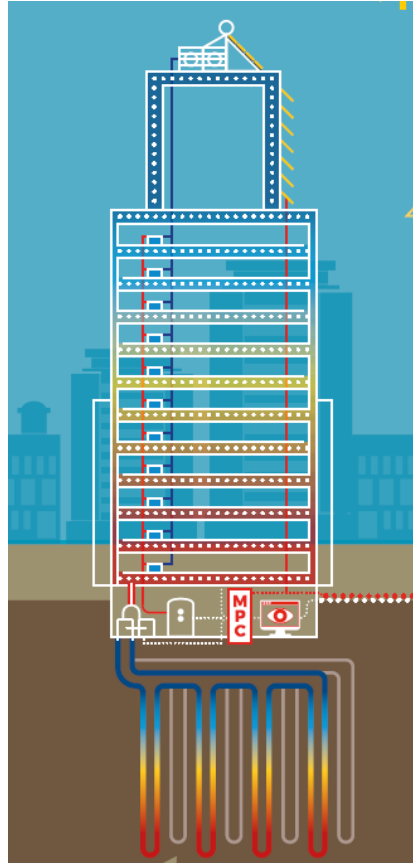
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Integral & optimizado

DISEÑO



Control optimizado

**Model
Predictive
Control**

RETOS DE DISEÑO

TABS + hybrid

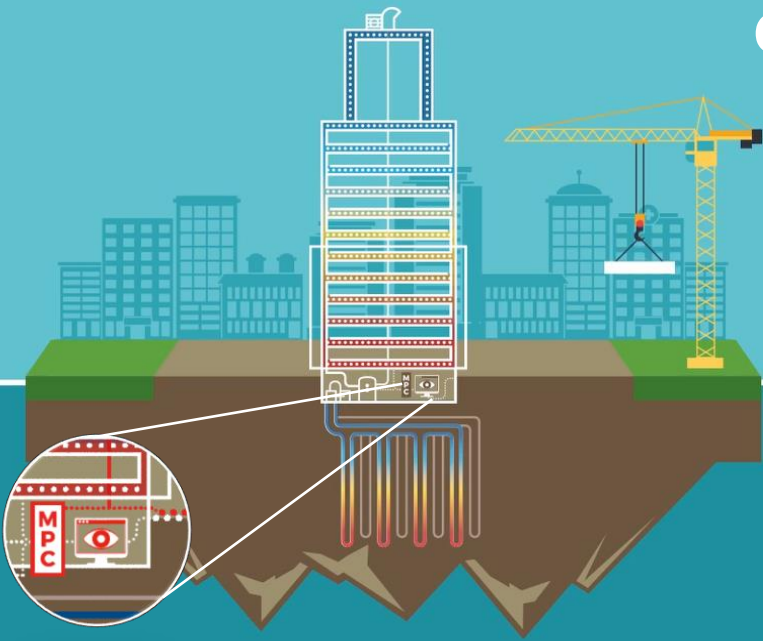
- Carga y tamaño
- Suavizar picos (TABS)
- Respuesta

GEOtermia + hybrid

- Carga y tamaño
- Balance geotermico
- Respuesta

MPC

- Impacto del control en dimensionamiento



Comportamiento

<->

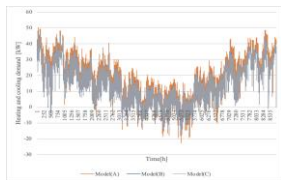
métodos de diseño

METODOLOGÍA DE PREDISEÑO

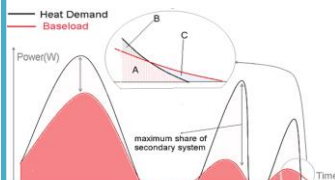
Step 1 Building Stock Database



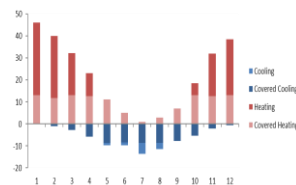
Step 2 Analysis of heating and cooling loads



Step 3 Load Splitting Algorithm for hybrid, storage- integrated systems



Step 4 Sizing and Performance estimation of HVAC system



Outcome Building stock Sizing and Performance

Database
&
Design tools

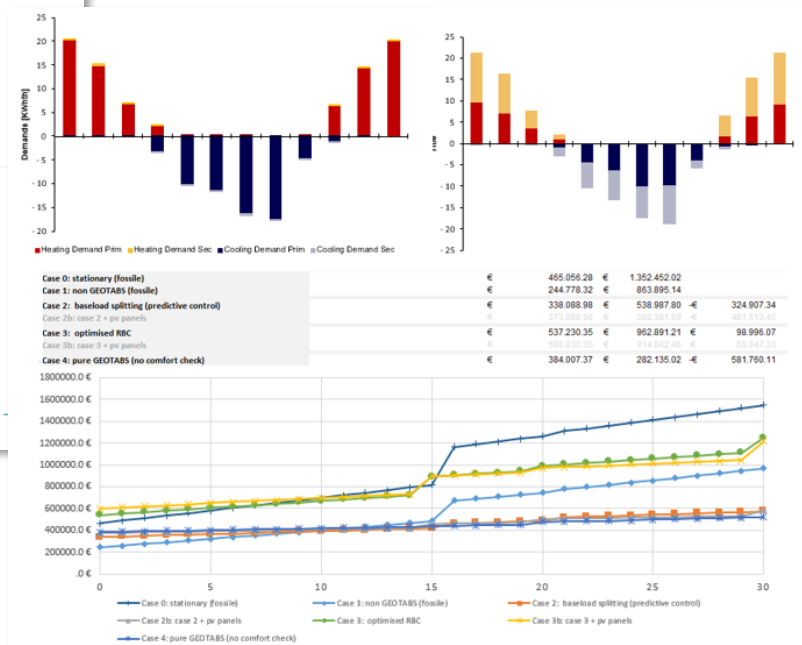
Verification Control-Integrated design study

HYBRIDGEOTABS HERRAMIENTA DE PREDISEÑO

BUILDING EFFICIENCY CALCULATOR

DEFINE YOUR DATA > 1 DATABASE BUILDING STOCK 2 DEMAND AND PEAK 3 FEASIBILITY STUDY

Fill in the details below to analyse your building's energy efficiency. Using database building stock we can generate accurate results on demand and peak, as well as feasibility studies.





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Demostradores hybridGEOTABS





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DEMOSTRADORES



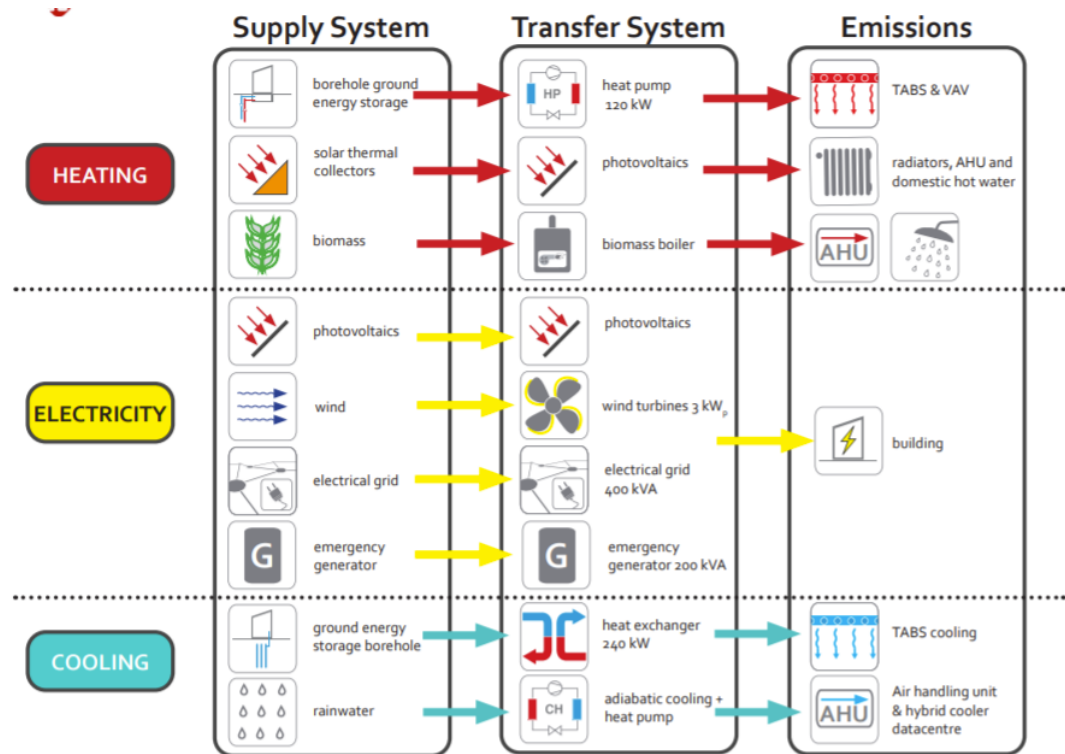
Solarwind (EXTRA), Infrax, Ter Potterie, Haus M y Libeznice school



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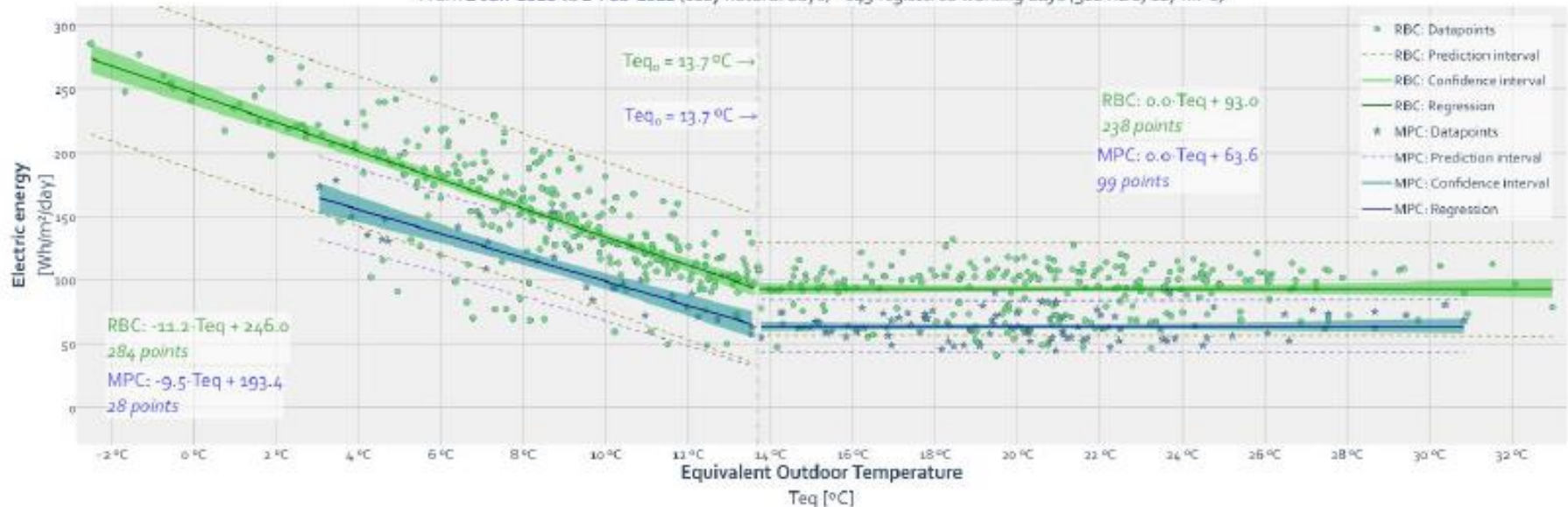
OFICINA HYBRIDGEOTABS SOLARWIND (LUX)





MPC en FLUVIUS/INFRAX (DILBEEK, BE)

Infrax - Daily electricity used by the HVACR system - Working days
From 1-Jan-2018 to 1-Feb-2021 (1127 natural days) - 649 registered working days (522 RBC, 127 MPC)





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DEMOSTRADOR - ESPAÑA

Edificio I+D+i SAICA, Zaragoza (Spain)



Propiedad	SAICA PAPER
Potencia térmica	200 kW
Sondeos	12 pozos de 150 metros
Ejecutado	Septiembre 2020 – Junio 2021



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DEMOSTRADOR ESPAÑA

Edificio I+D+i SAICA, Zaragoza (Spain)

Residencial 92 viviendas Rivas



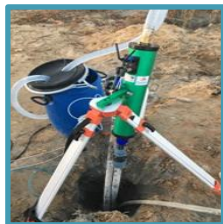


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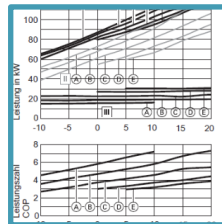
WWW.HYBRIDGEOTABS.EU

of the ground by integration

enerCORE Knowledge Centre

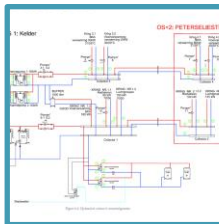


Diseño del **sistema
geotérmico**



Tecnología modular,
optimización de diseño de
los componentes clave

**Esquema hidráulicos
para soluciones
hybridGEOTABS**



Paneles radiantes
con **PCM**



Documentación
genérica para
LICITACIÓN



**Panel energético de
control y monitorización**



WWW.HYBRIDGEOTABS.EU

Libro

Video: <https://www.youtube.com/channel/UCQDBfhimW-bqATt31u8xQVg>

Training curriculum

How to exploit HybridGEOTABS

This training introduces the hybridGEOTABS concept and its key assets and is accessible for everyone fascinated by sustainable building. The curriculum is targeting mainly business-oriented audiences organised in 5 modules - each of them covering a different topic - with a total duration of approximately 1hr 40min.

Start Training



How to Design and Operate HybridGEOTABS

This training introduces the hybridGEOTABS concept and its main benefits and challenges, providing insights into the technical principles underlying the concept and the design. The curriculum is organised in 9+1 modules - each of them covering a different topic - with a total duration of approximately 11 hrs.

Start Training



enerCORE
Knowledge Centre

