

Aerothermal energy



Heating, a huge cost !

2/3 of energy expenditure in buildings



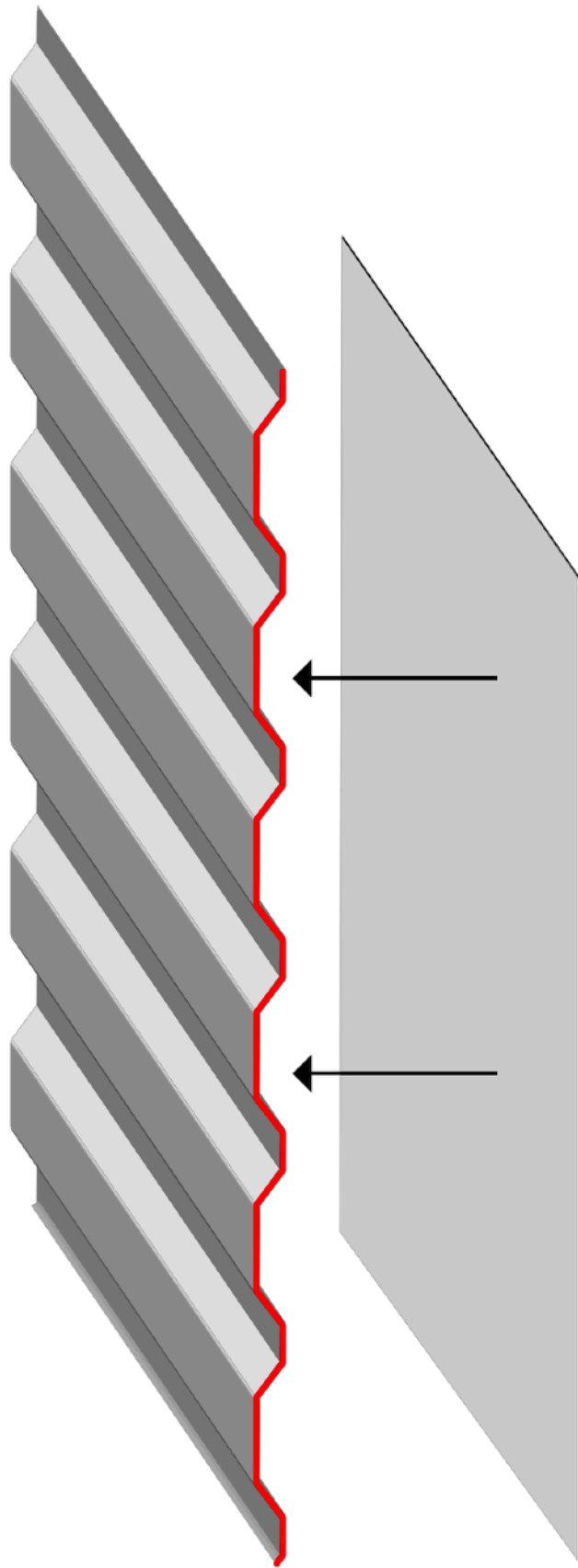
More than 150 billion € / year in France

Did you know ?

In winter, on a sunny day, the temperature of the cladding sheet on the walls of metal frame buildings is between **55** and **61**°C.

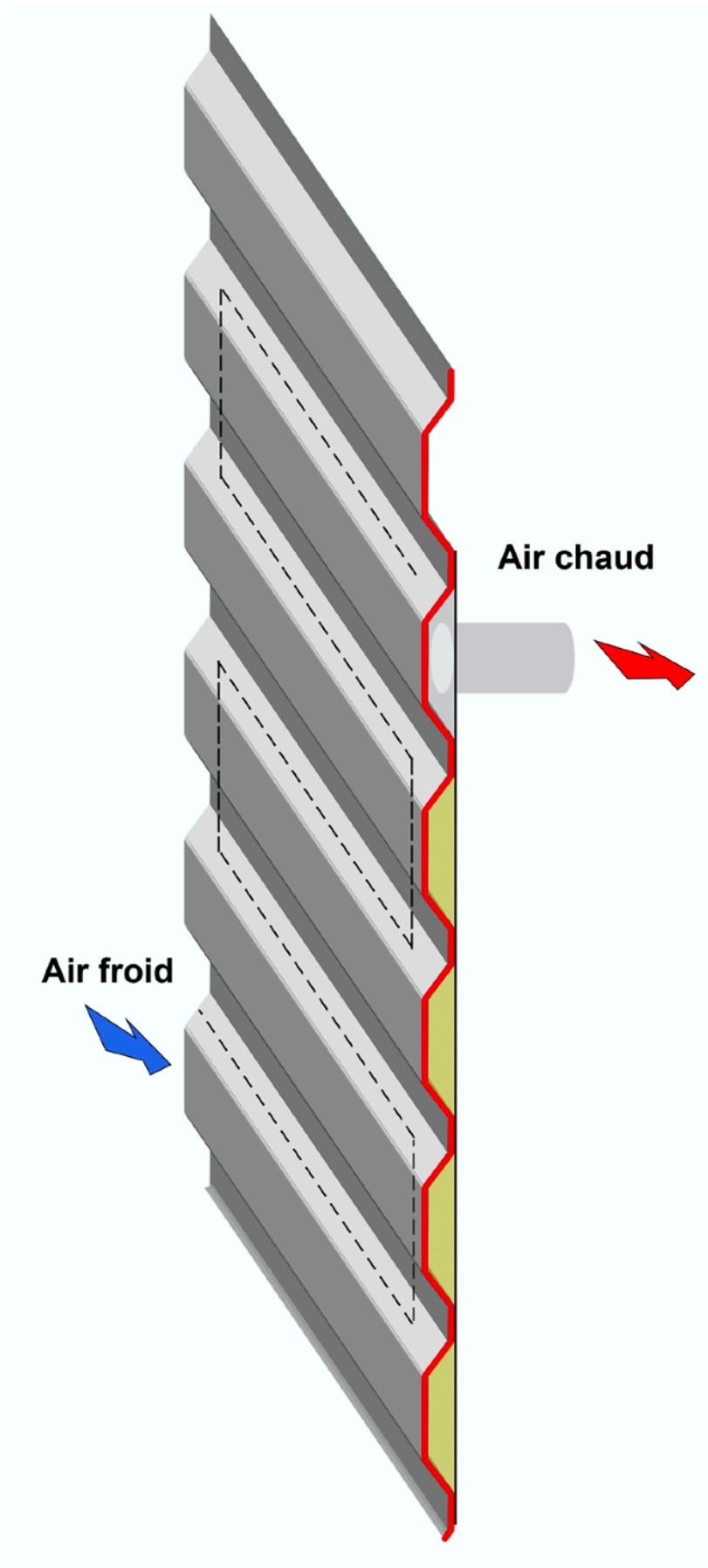
What if we valued this energy ?

The solution, the aerothermal wall



Close the ribs to form ducts.

The solution, the aerothermal wall



Circulate the cold outside air to gain an additional 38 ° C and inject it indoors.

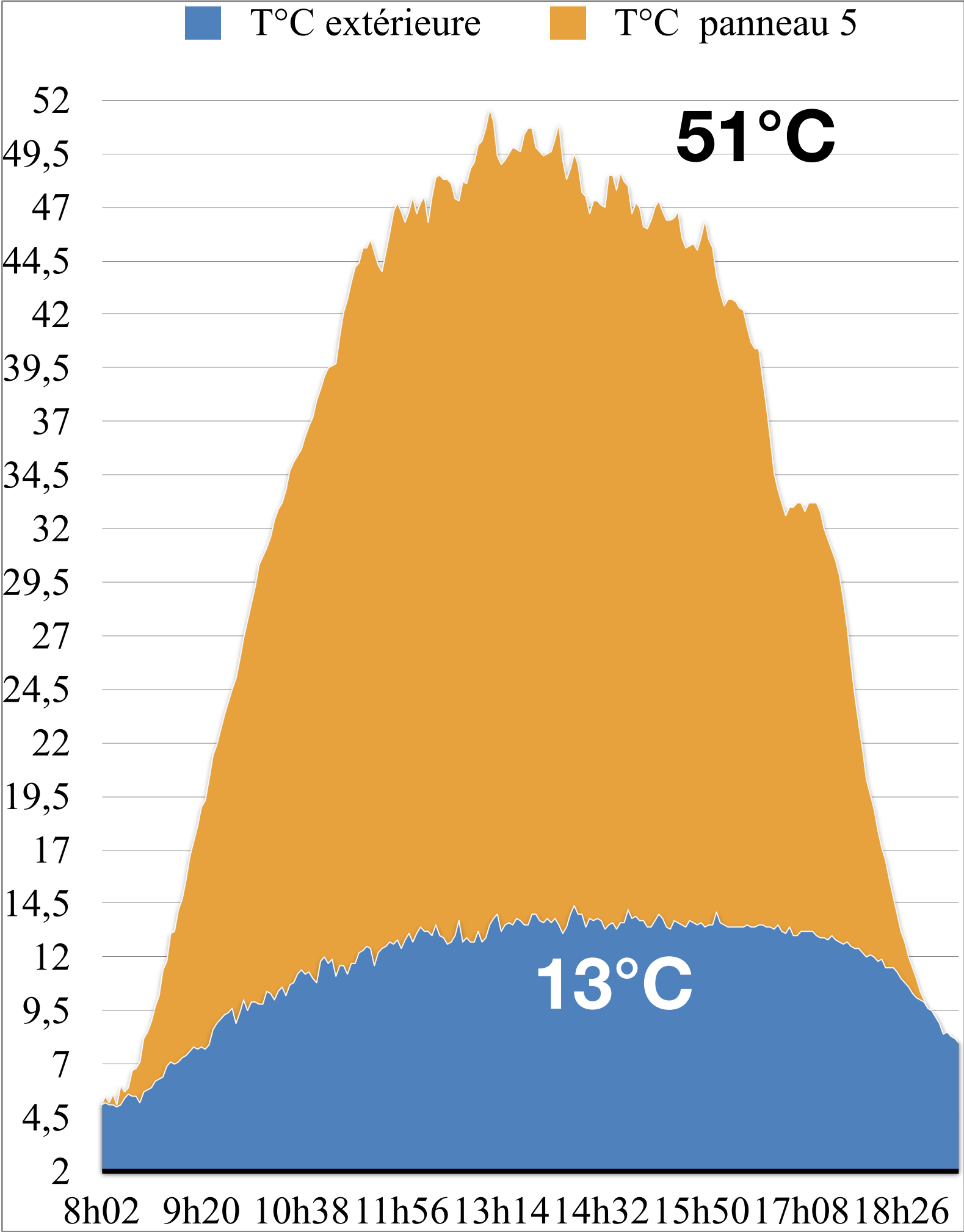
The different prototypes



Wall / ground version (drying).

Figures for February 21, 2020

600Wp/m²



Figures certified by **NOBATEK**

The NOBATEK design office

Phase 1
Analyse des données

- Analyse des données
- Formulation du problème
- Identification des ressources

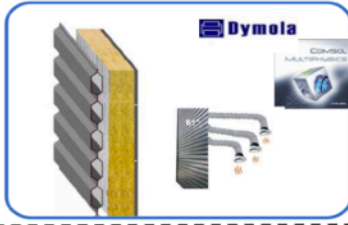


C1-C18



- Analyse des données
- Validation de la techno/pertinence
- Adéquation besoins bâtiments
- Compréhensions Rex (par ex question bardage 14m vs 21m)
- Recalcul puissance restituée et rendement

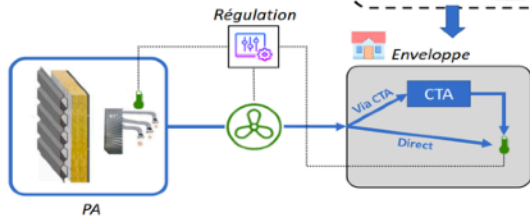
Phase 2
Modélisation PA



Calibration

- Simuler la performance sur d'autres conditions qu'expérimentales
- Axes d'amélioration
- Positionnement des perturbateurs
- Puissance restituée et rendement
- Prioritairement étude en condition chauffage

Phase 3
Couplage bâtiment



- Performance globale selon paramètres du PA et du logement.
- Axes d'amélioration
- Pourcentage d'économie d'énergie
- Prioritairement étude en condition chauffage

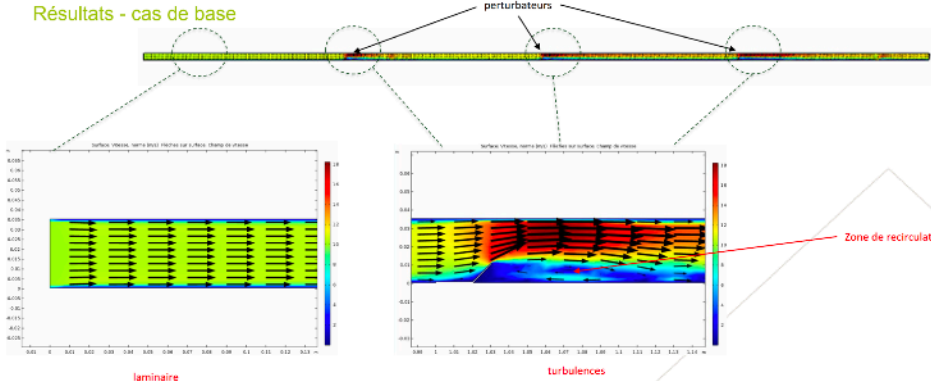
Phase 4
Analyse Tech-Eco

- Comment coupler le PA avec la ventilation dans le bâtiment ?
- Besoin certificat de conformité ?
- Titre V, FDES, ATEX ou ATEC ?

2



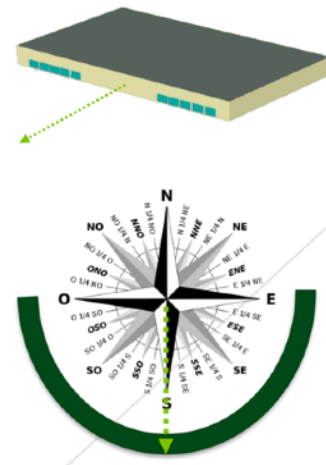
Résultats - cas de base



17/2020



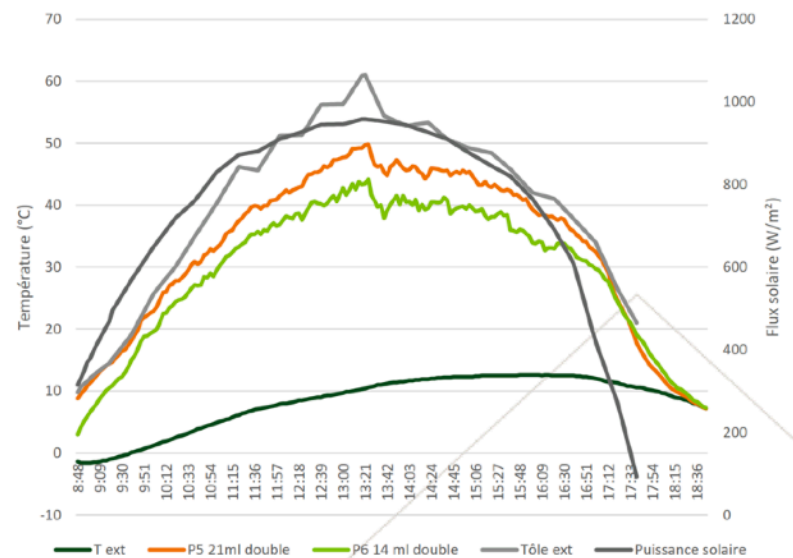
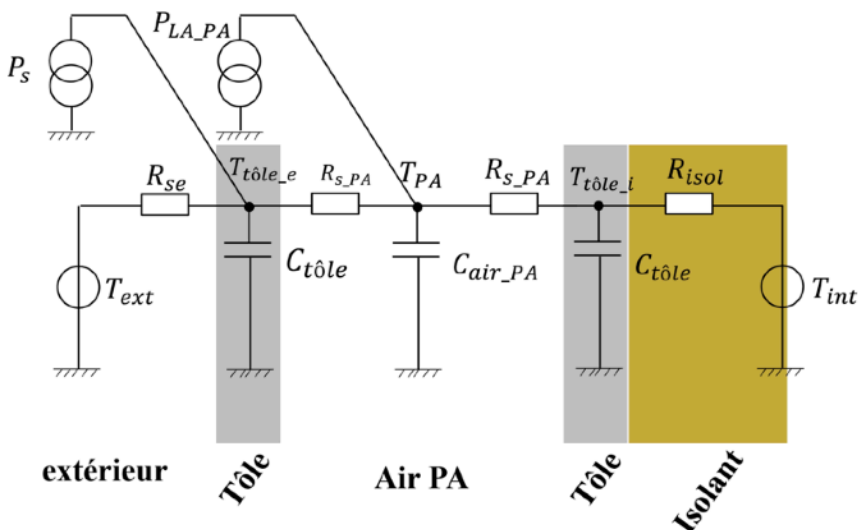
Orientation



PHASE 2 – MODÉLISATION PA

MODÉLISATION DU PA

Calibration avec C11



08/07/2020

17



Innovation : winter heater mode

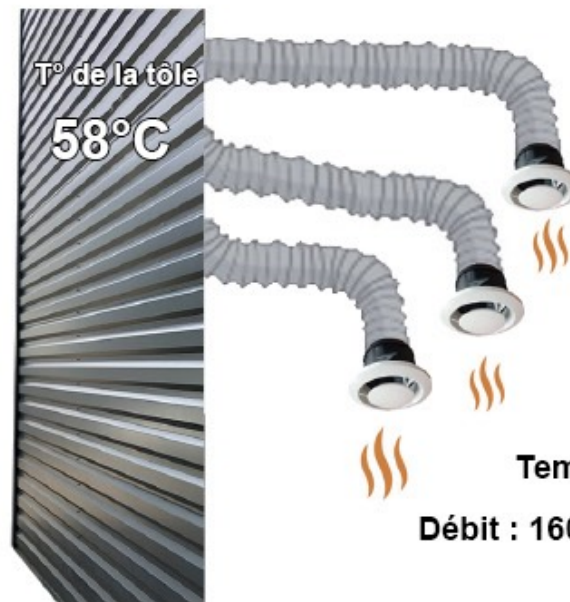


Le mur aérothermique l'hiver

L'hiver la journée



Température
extérieure de l'air : 8,5°C



Température : 48°C
Débit : 160m³/h tous les 4m²



On a sunny winter day, when the outside temperature is only 8.5 ° C, the air circulating in the channels heats up on contact with the sheet metal heated by the sun to 58 ° C.

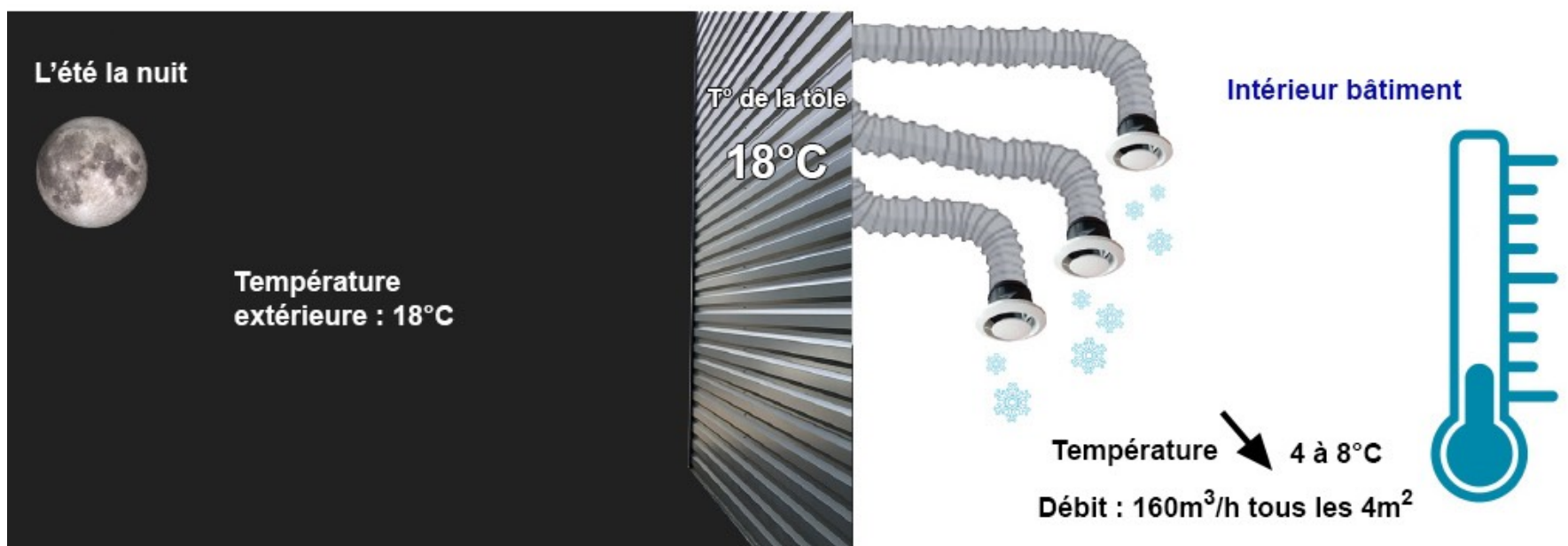
The air thus heated reaches 48 ° C and is then routed inside the building at a rate of 160m³ / h every 4m².

For a building of 1000m², with a surface of 100m² of aerothermal panels, you obtain a thermal power of 60,000 Wp.

Innovation : summer cooling mode



Le mur aérothermique l'été



In summer, at night, the temperature drops steadily to between 13 and 20 ° C.

Due to its very low inertia, the temperature of the sheet is the same as that of the air with a lag of a few minutes. When the temperature outside drops below that inside, a probe controls the air circulation and cools the temperature inside the building from 4 to 8 ° C at a rate of 160m³ / h every 4m².

Arriving in the morning, it is comfortable for the occupants and the air conditioning is delayed.

Innovation : wall drying mode

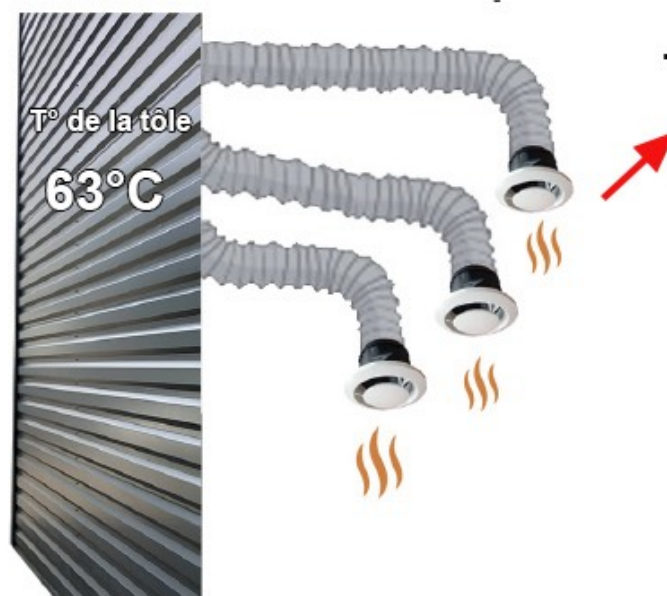


Le séchage avec le mur aérothermique

Printemps, été, automne



Température
extérieure de l'air : 31°C



T° de la tôle
63°C

Température de l'air vers séchoir :
52°C

Débit : 160m³/h tous les 2m²



During the day, in spring, summer and autumn, under the effect of the sun, the sheet regularly reaches 63 ° C. The air circulating in the channels heats up to reach 52 ° C, then is conveyed inside the building or to a dryer at the rate of 160m³ / h every 4m².

For a building of 1000m², with a surface of 100m² of aérothermal panels, you obtain a thermal power of 70,000 Wp with a flow rate of 4,000m³ / h.

Depending on your needs, you can dry cereals, grass, wood, industrial waste, paper, sludge from sewage treatment plants ...

Innovation : floor drying mode

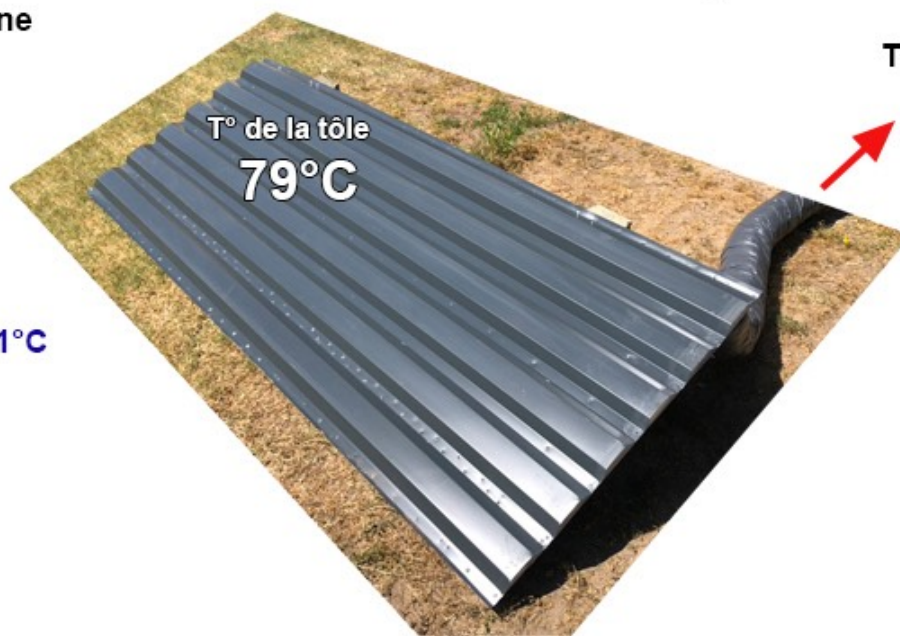


Le Séchage avec les panneaux au sol

Printemps, été, automne



Température
extérieure de l'air : 31°C



Température de l'air vers séchoir :

69°C

Débit : 160m³/h tous les 2m²



In its version on the ground (or on the roof), in spring, summer and autumn, under the effect of the sun, the sheet regularly reaches 79 ° C. The air circulating in the channels heats up to reach 69 ° C, then is conveyed inside the building or to a dryer at the rate of 160m³ / h every 4m².

With a surface of 200m² of aérothermal panels, you obtain a thermal power of 170,000 Wp with a flow of 8,000m³ / h.

Due to its adjustable inclination, the recovered power is maximum. You can dry cereals, grass, wood, industrial waste, paper, sludge from wastewater treatment plants ...



Up to **83** % savings

120 times

more energy
produced than
consumed



+ 38°C
in winter

Heating



-4 à -8°C
in summer

Cooling



Drying

Other advantages



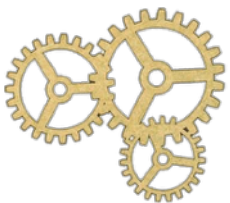
Compatible new and renovation



**Makes the
habitat passive**



**Absence de
Composé
Organique
Volatil**



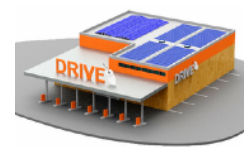
Reliable, Durable



Healthy air



**Invisible
Same art rules**



**Free space on
the roof**

A single Canadian competitor

The Air Booster aerothermal wall is :

- **More efficient**
- **More versatile**
- **Compatible with all types of walls**
- **Much cheaper**
- **Best R.O.I**

Customers, market



- Builders of metal buildings (700 in France source SCMF)
- Cladding installers
- Companies specializing in energy renovation
- Companies specializing in drying

Buildings :

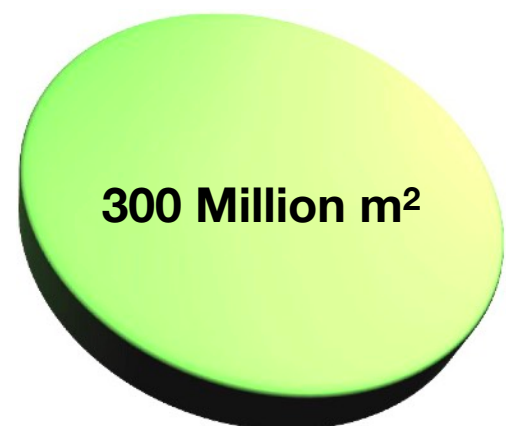
- Commercial
- for office use
- Industrial
- Storage
- Agricultural

New



Surface built in 2018
according to the FFB

Renovation



Estimated area over 20 years

Business model

bto**b**to**c**

- **New** (metal building builders)
- **Renovation** (companies in energy renovation)
- **Drying** (all types of drying)

R.O.I : between 3 et 8 years



1%
french market
(only new)
=
3,1 M€
turnover

State of progress & outlook

To do

Do

Pilote site (C-discount/others)

Technical advice

Technical partners :

- **Temporary**
- **Final**

Financial partners

Industrial partners

« Titre V »

Industrialization

Business Development

Patent 3 and 4

Heating market

International Development

...

Done

Statutes

Prototypes

Patent 1 et 2

**Design office
Nobatek**

They accompany me



Xavier PICAMOLES

Physician consultant



Grégory BOUTTEAU

Spécialist renewable energy



Christophe FOURCAUD

Founder Air Booster



Gérald DANTONY

Génie climatique



Eric BUYTAERT

Développeur marché BTP





Partner, Customer ?

**Interested in
R' Booster project ?**

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