ENERGIENCY

ENERGY INTELLIGENCE FOR MANUFACTURING

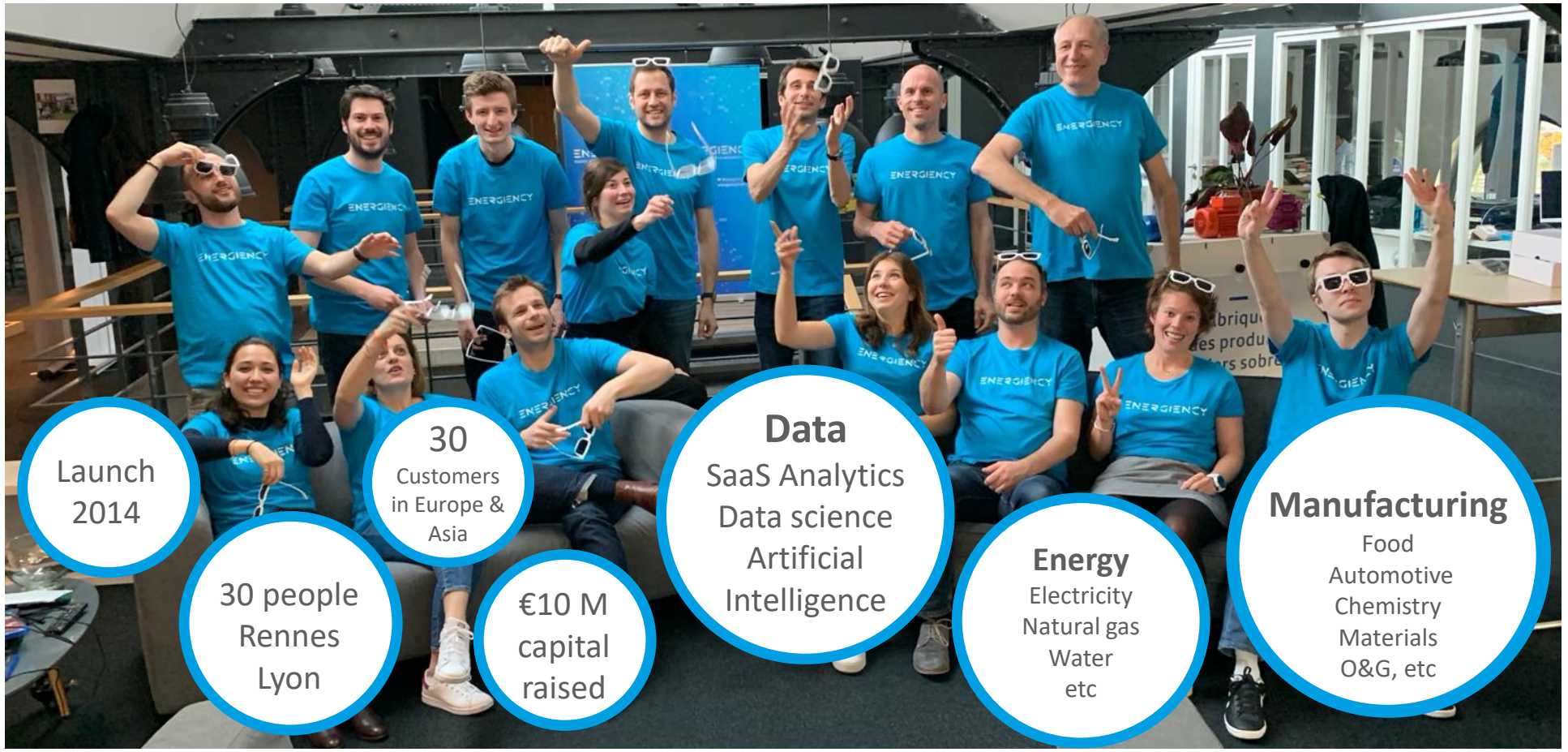
AFEP

Leveraging AI to save Energy in Manufacturing

09 16 20

01

Our ADN: Data + Energy + Manufacturing



encevo · isai · GO CAPITAL · West Web Valley · InnoEnergy · 50 PARTNERS · bpifrance · Investir l'Avenir · smile · Lauréat du PASS FRENCH TECH · Solar Impulse Efficient Solution

From industry 0.4… to industry 4.0

At plant level

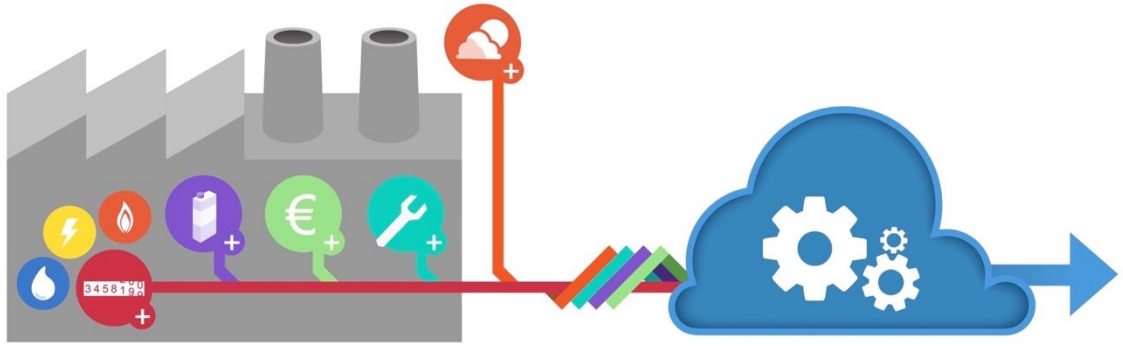
Improving real time
energy performance & CO2 footprint
with a spreadsheet ??

At corporate level

20% of energy savings &
CO2 emissions cut
in all plants without
updated action plans ?

Wanted: collaborative & smart energy analytics software!

Revealing value from industrial data



Data **Algorithms** **Analytics**

Turning raw industrial data into new energy & CO_2 saving opportunities

Detect & reduce kwh/t and $geCO_2$/t variability

- **Paper**

Challenge
- secure an already excellent control of electricity consumption

Solution
- real time (10 mn) electricity consumption ratio / type paper
- new target baseline calculated each year

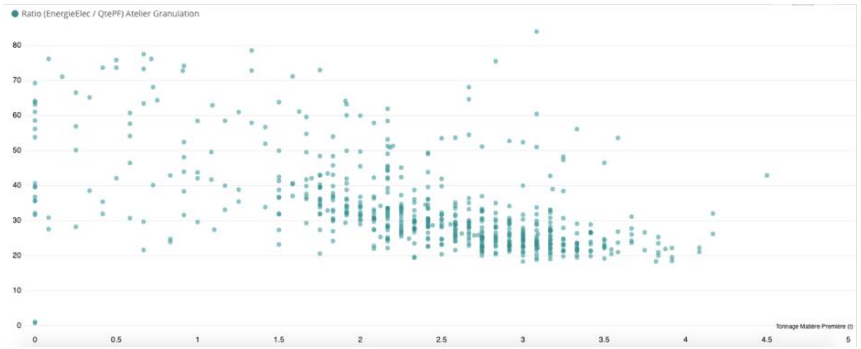
Results
→ **1% proven savings** out of a # €50 M/y electricity bill

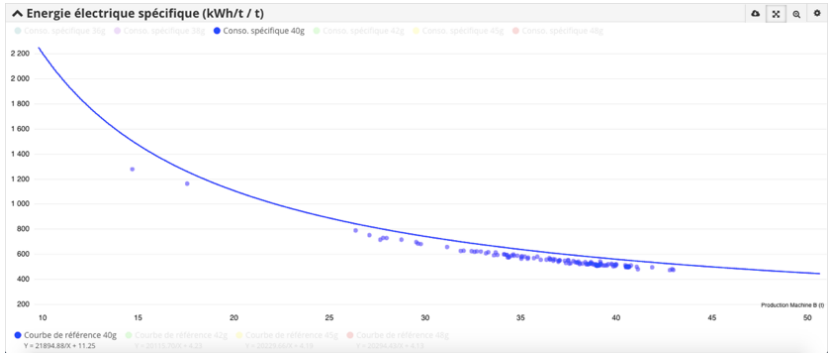
Food

Challenge
- Improve energy performance control (through monthly gas consumption ratio)

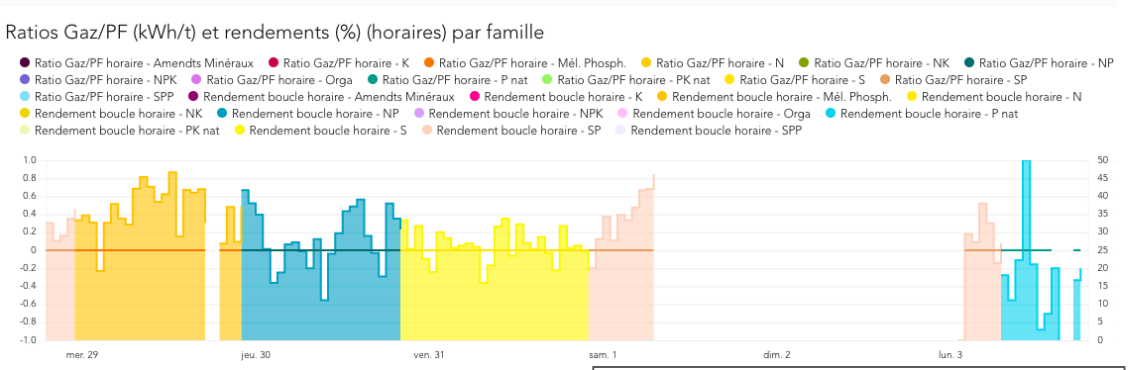
Solution
- real time (5 mn) gas consumption ratio calculated / type product
- automatic daily reports including energy performance for the 11 families of fertilizers produced

Results
→ **6% potential savings** out of a # €1 M/y energy bill





Real time energy & CO_2 accounting



Automated energy & CO_2 performance reports (shift, day, week, ..)

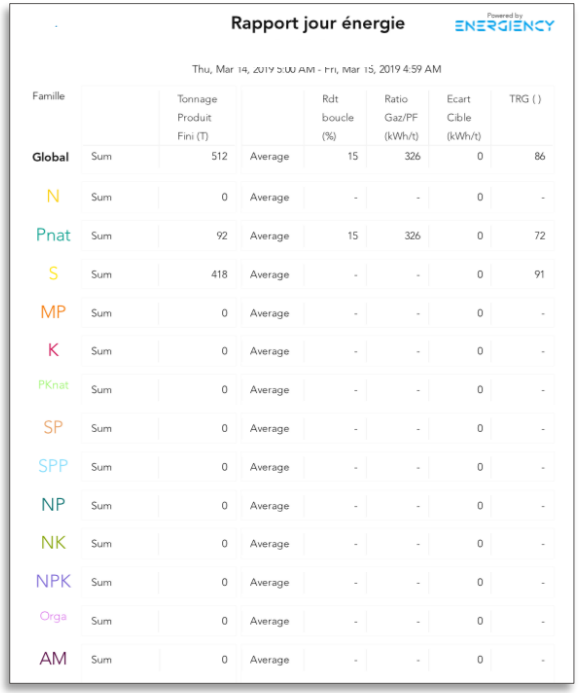
Energy and CO_2 allocation whatever the production level (OF, product, family of products, ..)

Weekly report on CO2 emissions

Lun. 23 sept. 2019 05:48 — Lun. 30 sept. 2019 05:48

Weekly Emissions (kgeqCO2)		Target	Emitted	Delta (%)
Electricity process	Somme	5679,4	5290,22	-6,9
Compressed air	Somme	2916,6	2149,83	-26,3

Weekly KPI - bearing production		Target	Realized	Delta (%)
Electricity process				
geqCO2 / kg	Moyenne	76,3	58,74	-23
geqCO2 / bearing	Moyenne	28,61	28,4	-0,8
Compressed air				
geqCO2 / kg	Moyenne	3,86	23,89	518,5
geqCO2 / bearing	Moyenne	10,69	11,27	5,4



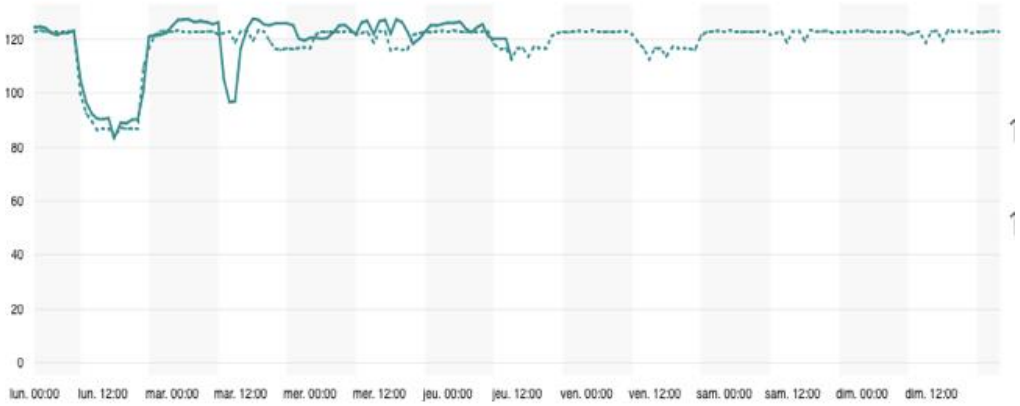
Rapport jour énergie

Powered by ENERGIENCY

Thu, Mar 14, 2019 5:00 AM - Fri, Mar 15, 2019 4:59 AM

Famille		Tonnage Produit Fini (T)		Rdt boucle (%)	Ratio Gaz/PF (kWh/t)	Ecart Cible (kWh/t)	TRG ( )
Global	Sum	512	Average	15	326	0	86
N	Sum	0	Average	-	-	0	-
Pnat	Sum	92	Average	15	326	0	72
S	Sum	418	Average	-	-	0	91
MP	Sum	0	Average	-	-	0	-
K	Sum	0	Average	-	-	0	-
PKnat	Sum	0	Average	-	-	0	-
SP	Sum	0	Average	-	-	0	-
SPP	Sum	0	Average	-	-	0	-
NP	Sum	0	Average	-	-	0	-
NK	Sum	0	Average	-	-	0	-
NPK	Sum	0	Average	-	-	0	-
Orga	Sum	0	Average	-	-	0	-
AM	Sum	0	Average	-	-	0	-

AI forecast models to reduce energy/CO_2 costs



Paper

Problem to solve
- Improve day ahead nomination accuracy to increase electricity bill rebate

Energiency solution
- Machine learning forecast model based on production planning

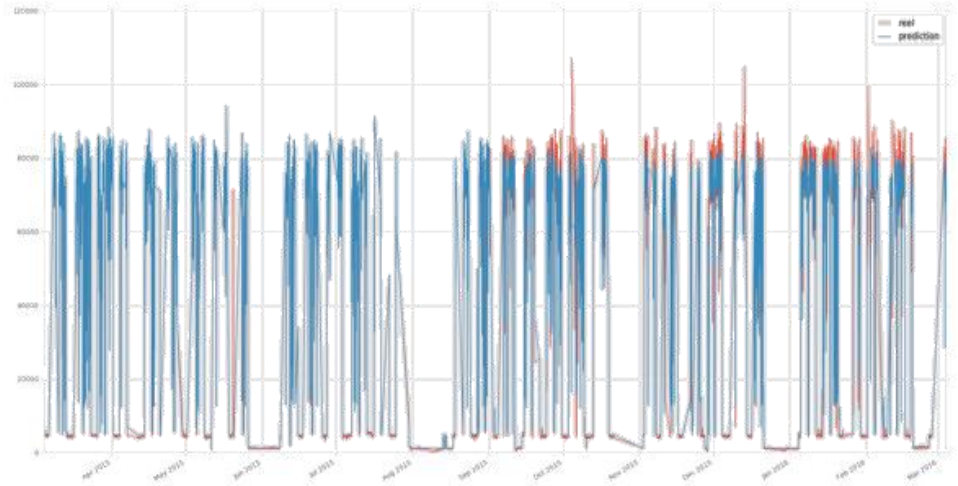
Results
→ 20% rebate increase

Steel

Problem to solve
- et up intraday nomination accuracy to reduce imbalance penalty

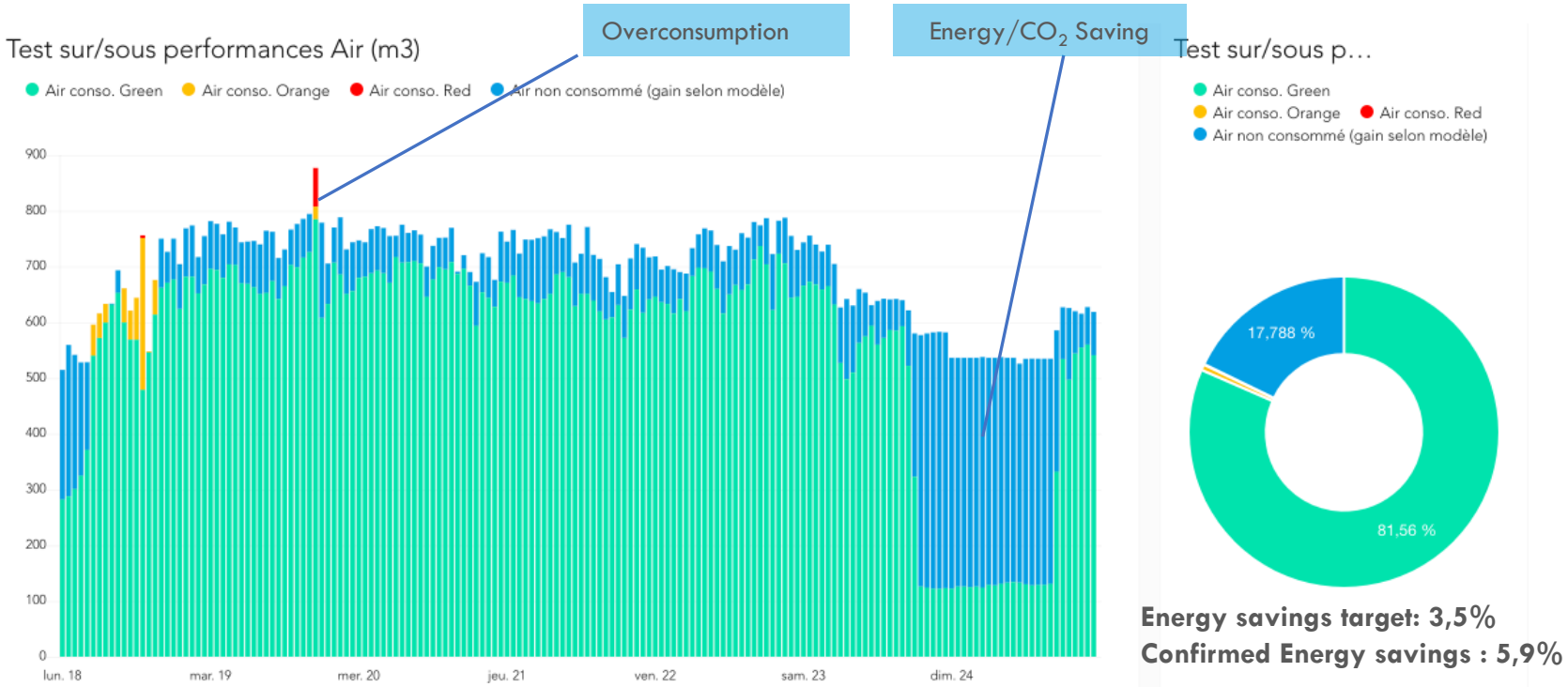
Energiency solution
- Machine learning forecast model based on production real time and forecast data
- Automatic 1h renomination

Results
→ Energy / CO_2 costs reduction potential #%



Energy and CO_2 real time digital twin

AI real time machine learning models running
Display energy drifts for better reactivity



Energy savings target: 3,5%
Confirmed Energy savings : 5,9%

Detect real time drifts & savings for better performance

05 Portfolio (extract)

ENERGIENCY

ENERGY INTELLIGENCE FOR MANUFACTURING

CONTACT

arnaud.legrand@energiency.com
+33 (0)6 70 89 10 36
@energiency

energiency.com