

CITY INFOGRAPHICS

Here is where this template begins

CITY INFOGRAPHICS

MERCURY

Mercury is the closest planet to the Sun and the smallest one

SATURN

Saturn is composed of hydrogen and helium and is the ringed one

VENUS

Venus has a beautiful name and is the second planet from the Sun



MARS

Mars is actually a cold place. It's full of iron oxide dust

JUPITER

Jupiter is a gas giant and the biggest planet in the Solar System

NEPTUNE

Neptune is the farthest planet from the Sun and the fourth-largest one

CITY INFOGRAPHICS

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MARS X

Mars is actually a cold place. It's full of iron oxide dust

JUPITER >

Jupiter is a gas giant and the biggest planet in the Solar System

NEPTUNE X

Neptune is the farthest planet from the Sun and the fourth-largest one

Distribution des tâches

Installation Azure (David)

Imputations (Manu)

DevOps (David)

Analyses (Manu)

Tests (David)

Conception de models

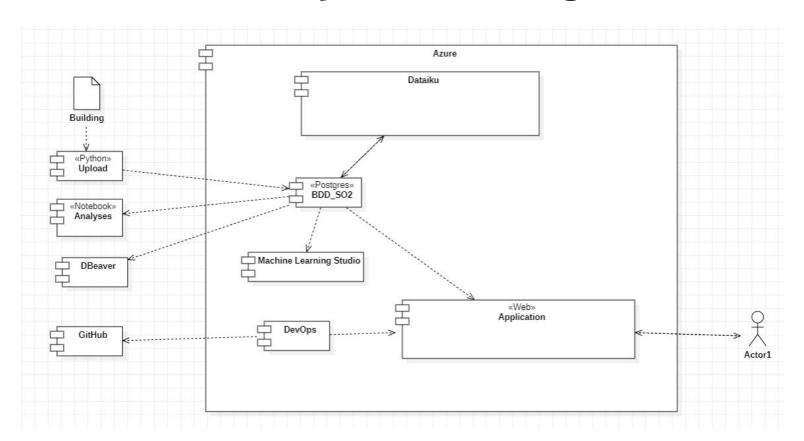
Chargement base (David)

(Manu, David)

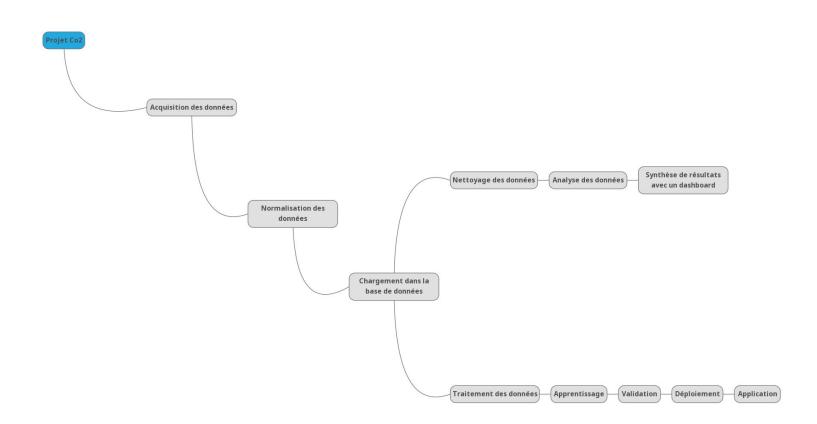
Flow Dataiku (Manu)

Présentation (Manu, David)

Installation, DevOps, Tests, Chargement Base.



Shema fonctionnel



Flow Dataiku



Suppression de colonnes

SUMMARY			Top 1 out of 1 values in sample	Count	%	Cum. %
Valid •	3,376	100.0 %	2016	3376	100.0	100.0
Нарах 🛈	0	0.0 %				
Invalid •	0	0.0 %				
Empty •	0	0.0 %				
0 HAPAXES		0.0 %				
0 INVALIDS		0.0 %				
SUMMARY			Top 1 out of 1 values in sample	Count	%	Cum. %
Valid •	3,376	100.0 %	Seattle	3376	100.0	100.0
Нарах 📵	0	0.0 %				
Invalid •	0	0.0 %				
Empty =	0	0.0 %				
0 HAPAXES		0.0 %				

Suppression de colonnes

SUMMARY			Top 50 out of 3362 values in sample	Count	%	Cum. %
Valid •	3,376	100.0 %	Northgate Plaza	3	0.1	0.1
Нарах 🐧	3,349	99.2 %			10000	30.00
Invalid •	0	0.0 %	Airport Way	2	0.1	0.1
Empty =	0	0.0 %	Bayview Building	2	0.1	0.2
 #4706 Bitte 	erlake	99.2 %	Canal Building	2	0.1	0.3
#8944 Wes(71367A) S		acy's	Central Park	2	0.1	0.3
• (71371A) N	ORTHGAT	E Macy's	Crestview Apartments	2	0.1	0.4
0 INVALIDS		0.0 %	Fairview	2	0.1	0.4

Idem pour adresse

Suppression de colonnes

Comments	Text	100.00%	0
☐ YearsENERGYSTARCertified	Integer	96.48%	0
☐ ThirdLargestPropertyUseType	Text	82.35%	0
☐ ThirdLargestPropertyUseType	Decimal	82.35%	0
☐ SecondLargestPropertyUseType	Text	50.27%	0
☐ SecondLargestPropertyUseTyp	Decimal	50.27%	0

Suppression outliers

		all a
Outlier Tex	t 99.05%	유

SUMMARY		
Valid •	3,376	100.0 %
Нарах 🐧	0	0.0 %
Invalid •	0	0.0 %
Empty =	3,344	99.1 %
0 HAPAXES		0.0 %
0 INVALIDS		0.0 %

Top 3 out of 3 values in sample	Count	%	Cum. %
No value	3344	99.1	99.1
Low outlier	23	0.7	99.7
High outlier	9	0.3	100.0

Suppression des features quantitatives liées à la target

☐ SiteEUIWN_kBtu_sf_	Decimal	99.82%
☐ SourceEUI_kBtu_sf_	Decimal	99.73%
☐ SourceEUIWN_kBtu_sf_	Decimal	99.73%
☐ SiteEnergyUse_kBtu_	Decimal	99.85%
☐ SiteEnergyUseWN_kBtu_	Decimal	99.82%
☐ SteamUse_kBtu_	Decimal	99.73%
☐ Electricity_kBtu_	Decimal	99.73%
☐ NaturalGas_kBtu_	Decimal	99.73%

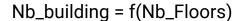
Imputation NumberofBuildings

```
D. "Neignbornood",

CASE WHEN "NumberofBuildings" IS NULL THEN 1 else "NumberofBuildings" END AS "NumberofBuildings",

b "NumberofEloors"
```

SUMMARY			SUMMARY		
Valid •	3,376	100.0 %	Valid •	3,367	100.0 %
Нарах 🐧	6	0.2 %	Нарах 🛈	6	0.2 %
Invalid •	0	0.0 %	Invalid •	0	0.0 %
Empty •	8	0.2 %	Empty •	0	0.0 %



	Number of Floors	*	123 round	*
1		4		1
2		3		1
3		2		1

Imputation LargestPropertyUseType

```
D. PropertyGFABUTIOTING_S_ ,

CASE WHEN "LargestPropertyUseTypeGFA" IS NULL THEN "PropertyGFABuilding_s_" else "LargestPropertyUseTypeGFA" end as "LargestPropertyUseTypeGFA",

b. "SecondLargestPropertyUseTypeGFA"
```



Imputation ZIPCode

Requêtte SQL.

```
CASE WHEN "ZipCode" IS NULL THEN (
select
zipcode
from
public."CO2_imputezipcode"
where
notzipLong = "Longitude"
and notzipLat = "Latitude"
) else "ZipCode" END AS "ZipCode",
```

zipcode double Decimal		notziplong double Decimal	notziplat double Decimal
	98125.0	-122.32232	47.70541
	98144.0	-122.29787	47.59905
	98117.0	-122.37717	47.6933
	98125.0	-122.29735	47.72126
	98107.0	-122.39228	47.67295
	98117.0	-122.37624	47.67734
	98119.0	-122.37525	47.63572
	98112.0	-122.31574	47.63228
	98122.0	-122.30225	47.60775
	98118.0	-122.27813	47.5644
	98126.0	-122.37441	47.54067
	98108.0	-122.31154	47.56722
	98104.0	-122.32283	47.59625
	98109.0	-122.35784	47.63644
	98108.0	-122.32431	47.52832
	98108.0	-122.29536	47.53939

Imputation ENERGYSTARScore

SUMMARY		
Valid •	3,376	100.0 %
Нарах 🛈	0	0.0 %
Invalid •	0	0.0 %
Empty •	843	25.0 %

	123 energystarscore_imputation	~	123 count	123 deceny
1		77	138	1 900
2		76	126	1 910
3		78	220	1 920
4		68	53	1 930
5		75	60	1 940
6		75	161	1 950
7	1	70	356	1 960
8		67	251	1 970
9		74	350	1 980
10		76	265	1 990
11		76	361	2 000
12		93	192	2010

Transformation de features

Utilise un type d'énergie

SteamUse_kBtu_	Decimal	☐ Have_Stream_Energy	Boolean
☐ Electricity_kBtu_	Decimal	☐ Have_Electricity_Energy	Boolean
☐ NaturalGas_kBtu_	Decimal	☐ Have_NaturalGas_Energ	Boolean

```
b."SteamUse_kBtu_" > 0.0 as "Have_Stream_Energy",
b."Electricity_kBtu_" > 0.0 as "Have_Electricity_Energy",
b."NaturalGas_kBtu_" > 0.0 as "Have_NaturalGas_Energy",
```



SUMMARY		
Valid •	3,314	100.0 98
Нарах 🕕	0	0.0 96
Invalid •	0	0.0 96
Empty =	0	0.0 98

Top 2 out of 2 values in sample	Count	96	Cum. %
true	2090	63.1	63.1
false	1224	36.9	100.0

Transformation de features

Log de features

```
log ("LargestPropertyUseTypeGFA") as "LargestPropertyUseTypeGFA_log",
log ("TotalGHGEmissions") as "TotalGHGEmissions_log",
log ("SiteEnergyUse_kBtu_") as "SiteEnergyUse_kBtu_log"
```



Sélection de features

☐ YearBuilt	Integer	100.00%
☐ BuildingType	Text	100.00%
☐ Neighborhood	Text	100.00%
☐ Have_Stream_Energy	Boolean	100.00%
☐ Have_Electricity_Energy	Boolean	100.00%
☐ Have_NaturalGas_Energy	Boolean	100.00%
☐ PrimaryPropertyType	Text	100.00%
NumberofBuildings	Integer	100.00%
☐ LargestPropertyUseTypeGFA	Decimal	100.00%
☐ TotalGHGEmissions	Decimal	100.00%
☐ SiteEnergyUse_kBtu_	Decimal	100.00%
☐ LargestPropertyUseTypeGF	Decimal	100.00%
☐ TotalGHGEmissions_log	Decimal	100.00%
☐ SiteEnergyUse_kBtu_log	Decimal	100.00%

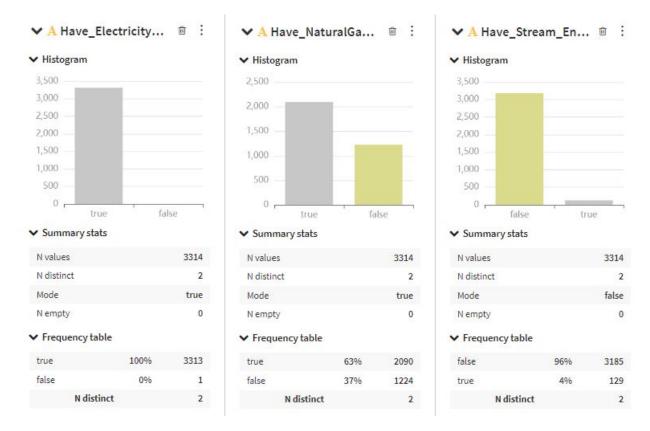
On conserve les targets, TotalGHGEmission et SiteEnergyUse.

On cherche à prédire les deux targets en fonction du projet.

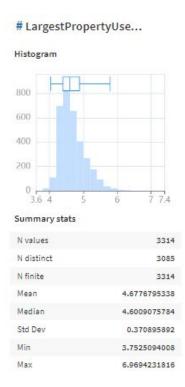
Un projet intègre :

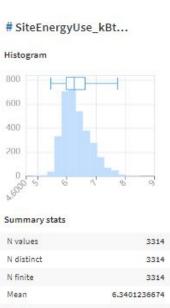
- Des types d'énergie.
- Des usages (résidentiels).
- Une zone géographique (quartier).
 Une surface.
- Un nombre de bâtiments.

La date de construction de bâtiments est un élément temporel.



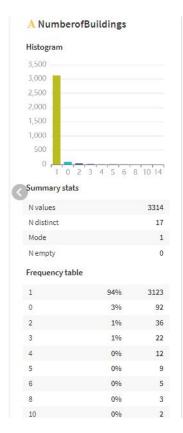
YearBuilt Histogram 400 300 200 100 1900 1920 1940 1960 1980 2000 2020 Summary stats N values 3314 N distinct 113 Mean 1968.6976463 Median 1975 Min 1900 Max 2015

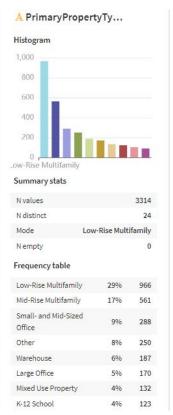


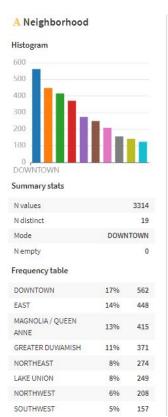


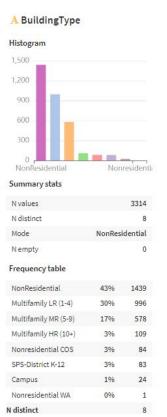
Summary stats	
N values	3314
N distinct	3314
N finite	3314
Mean	6.3401236674
Median	6.2604589349
Std Dev	0.493740552
Min	4.7568885434
Max	8.9414735231

Histogram				
600			-	
500				
100				
300				
200				
00				
0.40	i	2	3	4 4.4
		2	3	44.4
ummary stat	100			
	ts			
V values	ts			3314
N values	ts			3314 2782
N values N distinct	ts			
Summary stat N values N distinct N finite Mean	ts		1,528	2782
N values N distinct N finite Mean	ts			2782 3314
N values N distinct N finite Mean Median	ts		1.535	2782 3314 6686172
N values N distinct N finite	ts		1.535 0.645	2782 3314 6686172 60407393

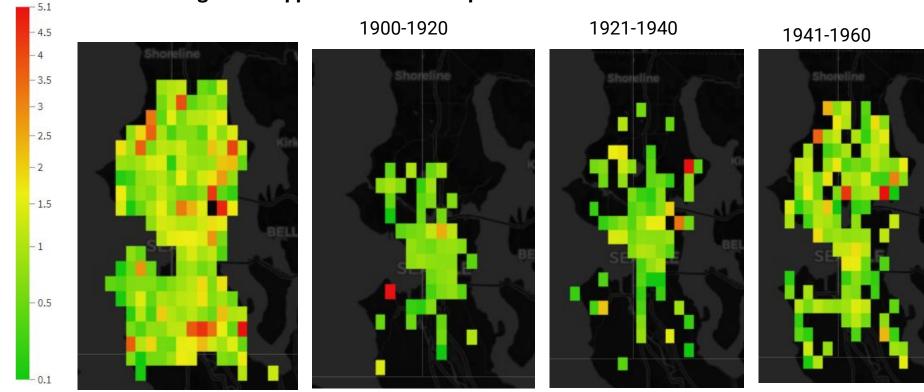




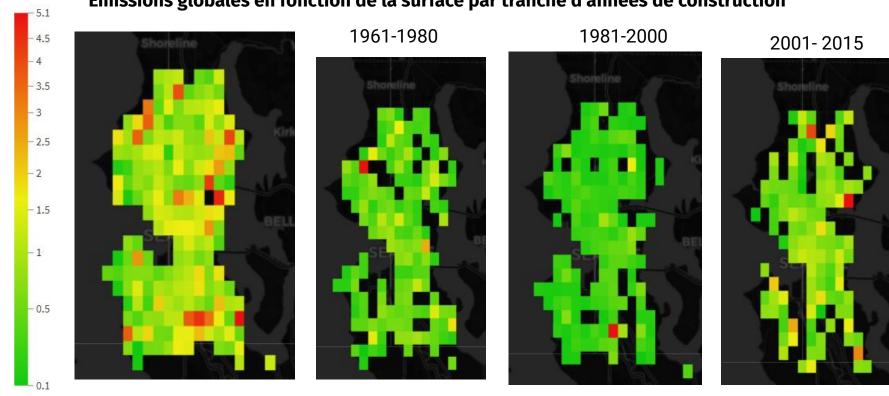




Analyses Émissions globales apportées à la surface par tranche d'années de construction

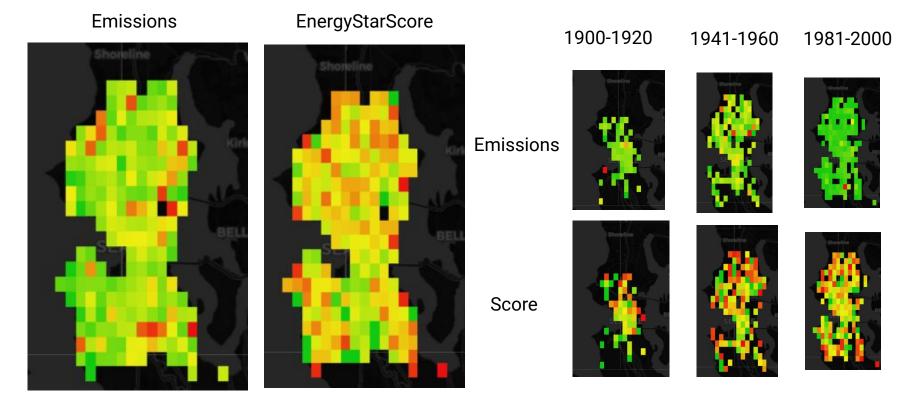


Émissions globales en fonction de la surface par tranche d'années de construction



Analyses

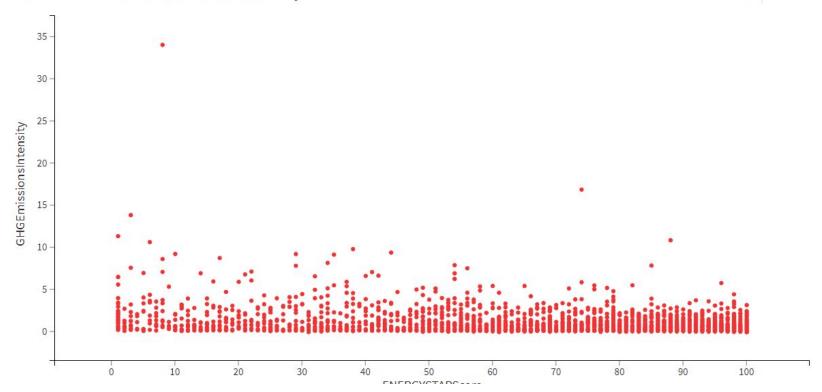
Émissions globales à comparer avec les évaluation de EnergyStarScore

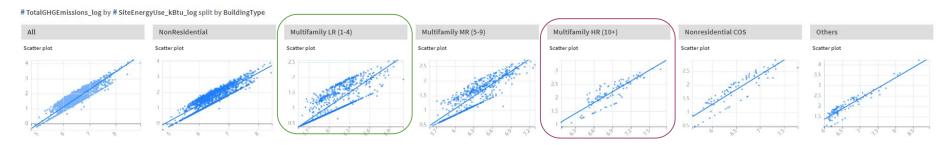


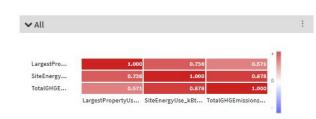


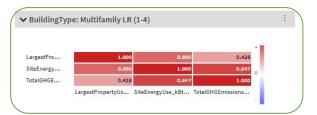






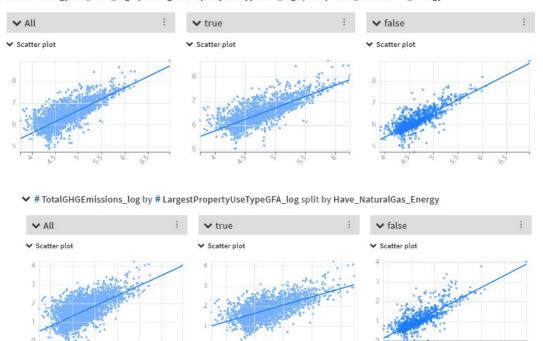


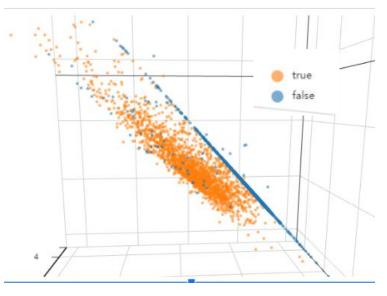




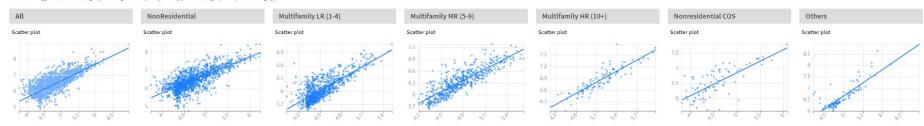


▼ # SiteEnergyUse_kBtu_log by # LargestPropertyUseTypeGFA_log split by Have_NaturalGas_Energy

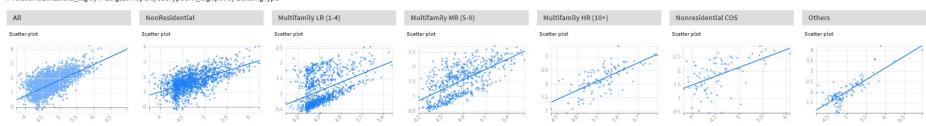




#SiteEnergyUse_kBtu_log by #LargestPropertyUseTypeGFA_log split by BuildingType



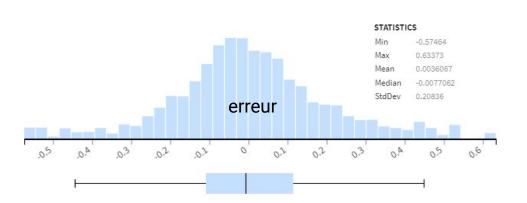
TotalGHGEmissions_log by # LargestPropertyUseTypeGFA_log split by BuildingType

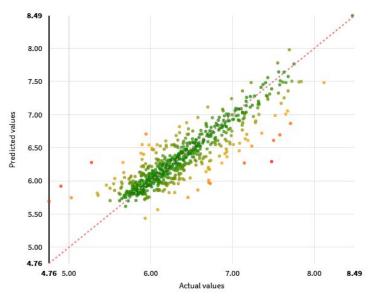


Avec Dataiku (SiteEnergyUse)

R2 Score

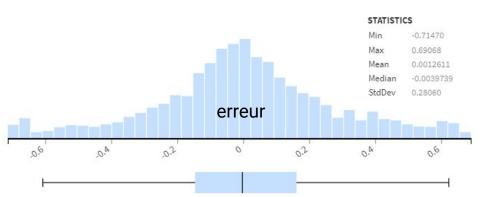
Random forest (s19)	0.748 (± 0.027)	☆
Ridge (L2) regression (s19)	0.780 (± 0.024)	☆
SVM (s19)	🕐 0.785 (± 0.024)	☆
Single Layer Perceptron (s19)	0.740 (± 0.168)	公

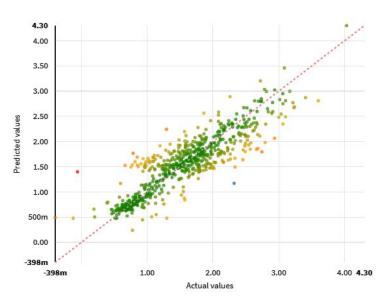




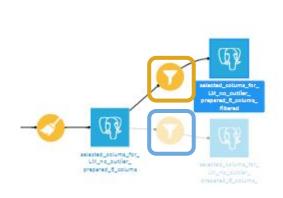
Avec Dataiku (TotalGHGEmission)

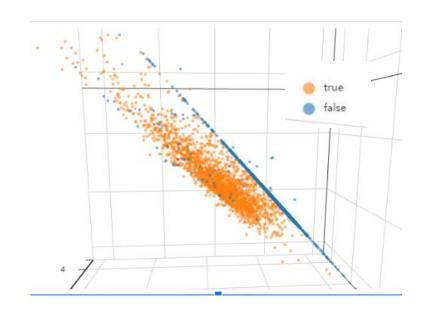




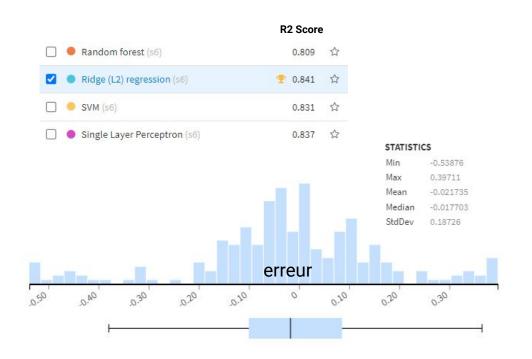


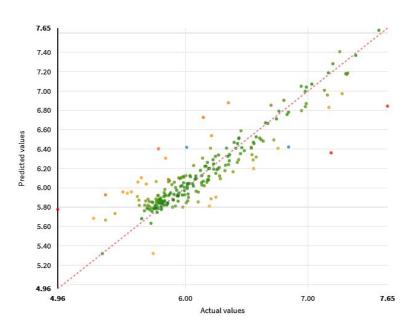
Avec Dataiku (TotalGHGEmission si avec GazEnergy ou sans GazEnergy)



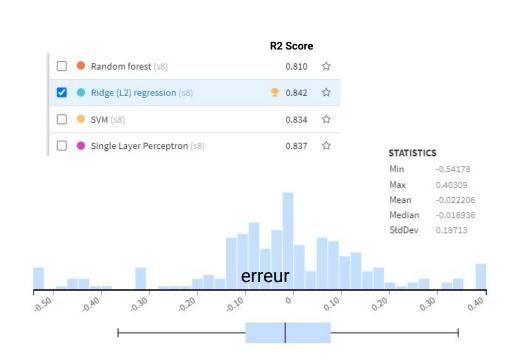


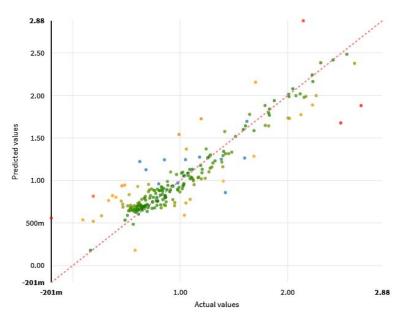
Avec Dataiku (TotalGHGEmission sens GazEnergy)





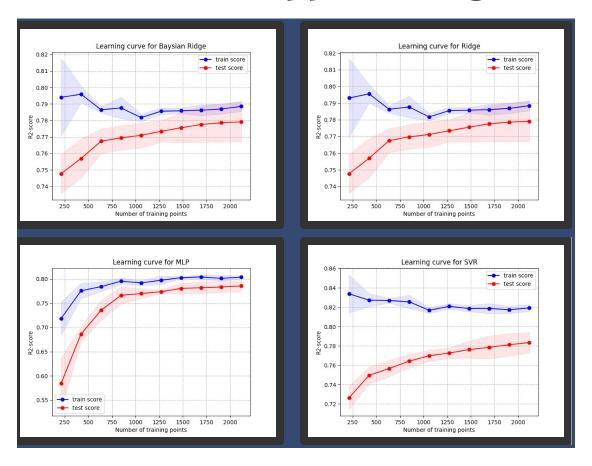
Avec Dataiku (TotalGHGEmission avec GazEnergy)





Résultats

Courbes d'apprentissage



Recommendations

- Limiter la superficie des nouveaux bâtiments
- Encourager l'utilisation des énergies alternatives au gaz
- Surveiller les bâtiments énergivore (campus & hôpitaux)

Conclusions

MERCURY

Mercury is the closest planet to the Sun and the smallest one

SATURN

Saturn is composed of hydrogen and helium and is the ringed one

VENUS

Venus has a beautiful name and is the second planet from the Sun



JUPITER

Jupiter is a gas giant and the biggest planet in the Solar System

NEPTUNE

A

Mars is actually a cold place. It's full of iron oxide dust

C

Saturn is composed of hydrogen and helium and is the ringed one



B

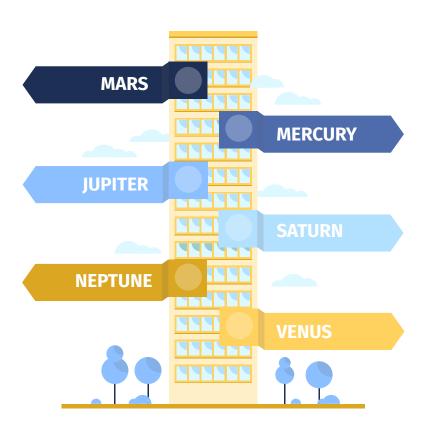
Venus has a beautiful name and is the second planet from the Sun

D

Despite being red, Mars is actually a cold place. It's full of iron oxide dust

Jupiter is a gas giant and the biggest planet in the Solar System

Neptune is the farthest planet from the Sun and the fourth-largest one



Mercury is the closest planet to the Sun and the smallest one

Saturn is composed of hydrogen and helium and is the ringed one

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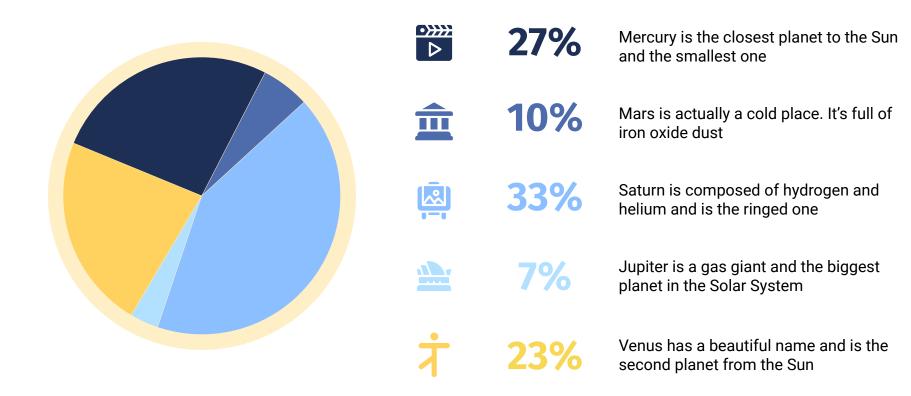
MARS

Mars is actually a cold place. It's full of iron oxide dust

JUPITER

Jupiter is a gas giant and the biggest planet in the Solar System

NEPTUNE



24%

Mars is actually a cold place. It's full of iron oxide dust

59%

Venus has a beautiful name and is the second planet from the Sun

38%

Saturn is composed of hydrogen and helium and is the ringed one



46%

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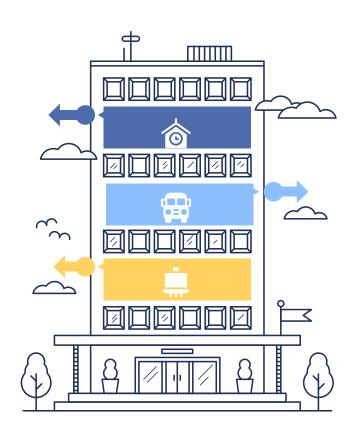
NEPTUNE

75%

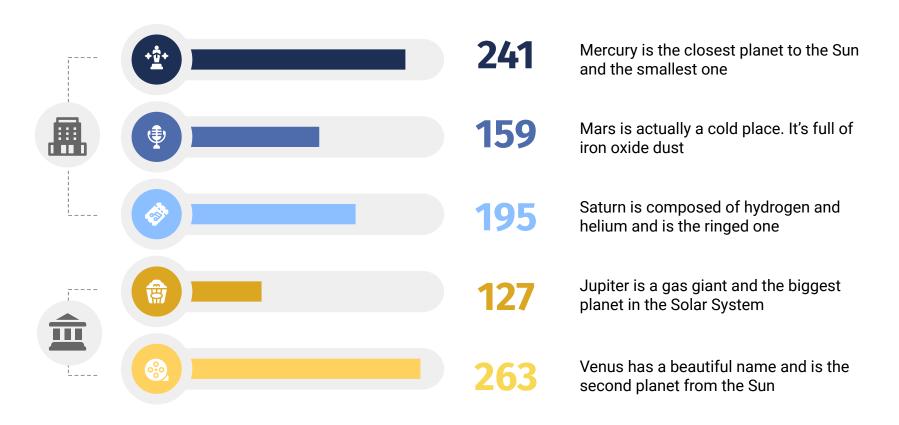
Mars is actually a cold place. It's full of iron oxide dust

37%

Saturn is composed of hydrogen and helium and is the ringed one



62%



A

B

Mars is actually a cold place. It's full of iron oxide dust



Venus has a beautiful name and is the second planet from the Sun

C

D

Saturn is composed of hydrogen and helium and is the ringed one

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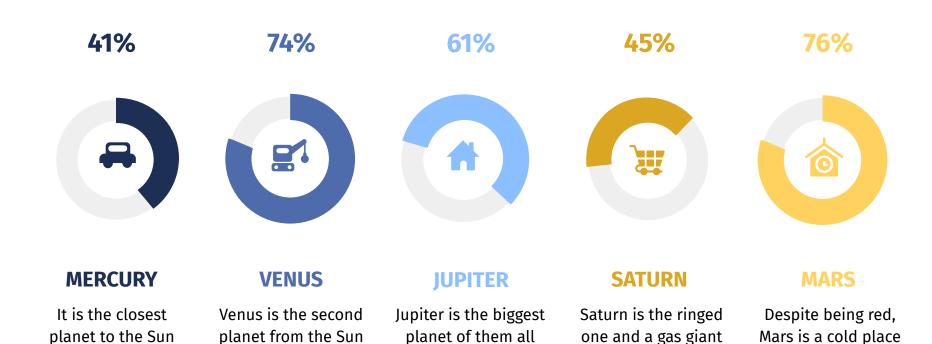
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MERCURY

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SATURN

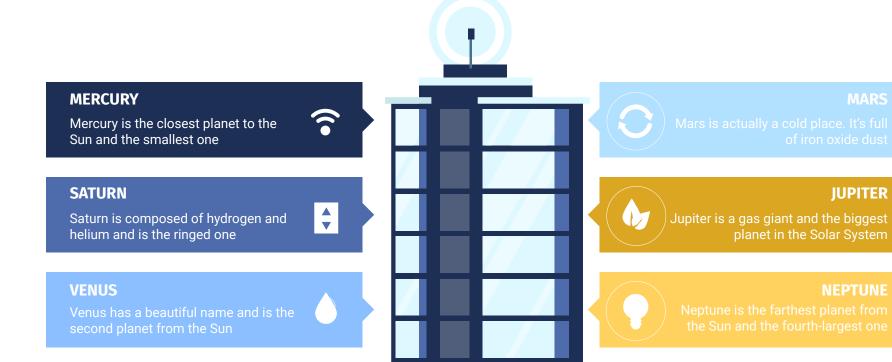
Saturn is composed of hydrogen and helium and is the ringed one

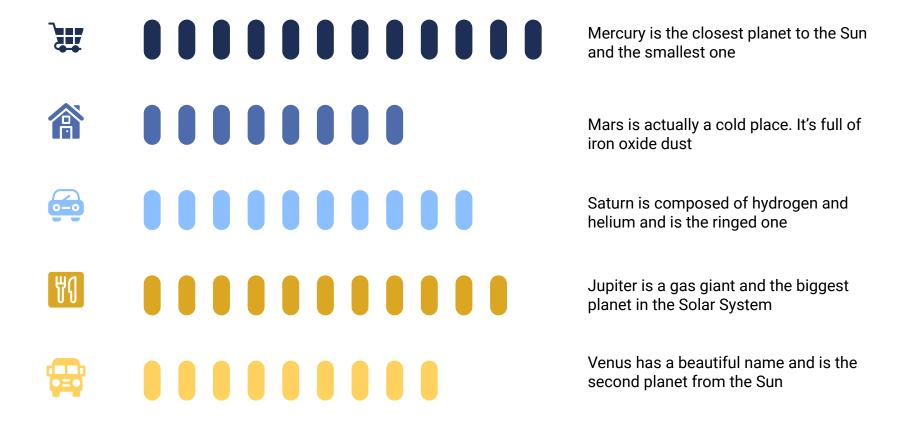


JUPITER

Jupiter is a gas giant and the biggest planet in the Solar System









Mercury is the closest planet to the Sun and the smallest one



SATURN

Saturn is composed of hydrogen and helium and is the ringed one







Mars is actually a cold place. It's full of iron oxide dust



Jupiter is a gas giant and the biggest planet in the Solar System

24%

Mars is actually a cold place. It's full of iron oxide dust

15%

Saturn is composed of hydrogen and helium and is the ringed one



17%

Venus has a beautiful name and is the second planet from the Sun

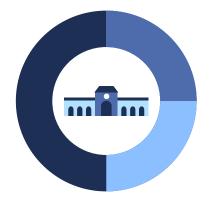
44%

50%

Mercury is the closest planet to the Sun and the smallest one

24%

Saturn is composed of hydrogen and helium and is the ringed one





50%

Mars is actually a cold place. It's full of iron oxide dust

25%

Jupiter is a gas giant and the biggest planet in the Solar System

26%

Venus has a beautiful name and is the second planet from the Sun 25%

A

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Venus has a beautiful name and is the second planet from the Sun

C

Saturn is composed of hydrogen and helium and is the ringed one D

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NEPTUNE



MERCURY

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JUPITER

Jupiter is the biggest planet of them all



SATURN

It is a ringed planet and a gas giant



MARS

Despite being red, Mars is a cold place



MERCURY

Mercury is the closest planet to the Sun



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JUPITER

Jupiter is the biggest planet in the Solar System



SATURN

Saturn is the ringed planet and a gas giant

MERCURY

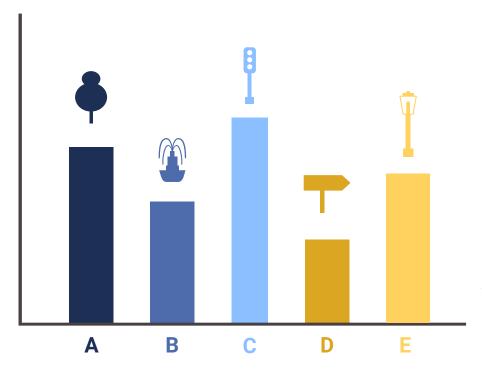
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VENUS

Venus has a beautiful name and is the second planet from the Sun



MARS

Mars is actually a cold place. It's full of iron oxide dust



JUPITER

Jupiter is a gas giant and the biggest planet in the Solar System



A

Mars is actually a cold place. It's full of iron oxide dust

B

Venus has a beautiful name and is the second planet from the Sun

C

Saturn is composed of hydrogen and helium and is the ringed one D



Mercury is the closest planet to the Sun and the smallest one



SATURN

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Venus has a beautiful name and is the second planet from the Sun







Jupiter is a gas giant and the biggest planet in the Solar System

NEPTUNE



A

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C

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B

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D

MERCURY

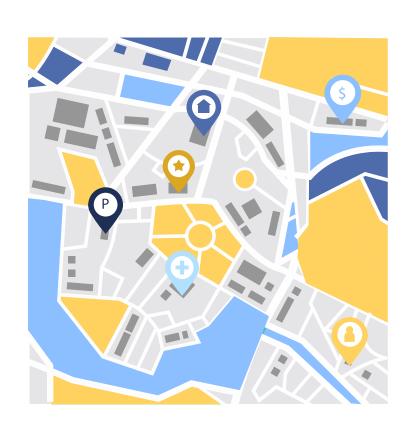
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 + Ctrl V or Cmd C + Cmd V in Mac.
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- Change the color by clicking on the paint bucket.
- Then resize the element by clicking and dragging one of the square-shaped points of its bounding box (the cursor should look like a double-headed arrow).
 Remember to hold Shift while dragging to keep the proportions.
- Group the elements again by selecting them, right-clicking and choosing "Group".
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