Wind and PV in spatial planning: Objectives, procedures and land availability

The SNCF case

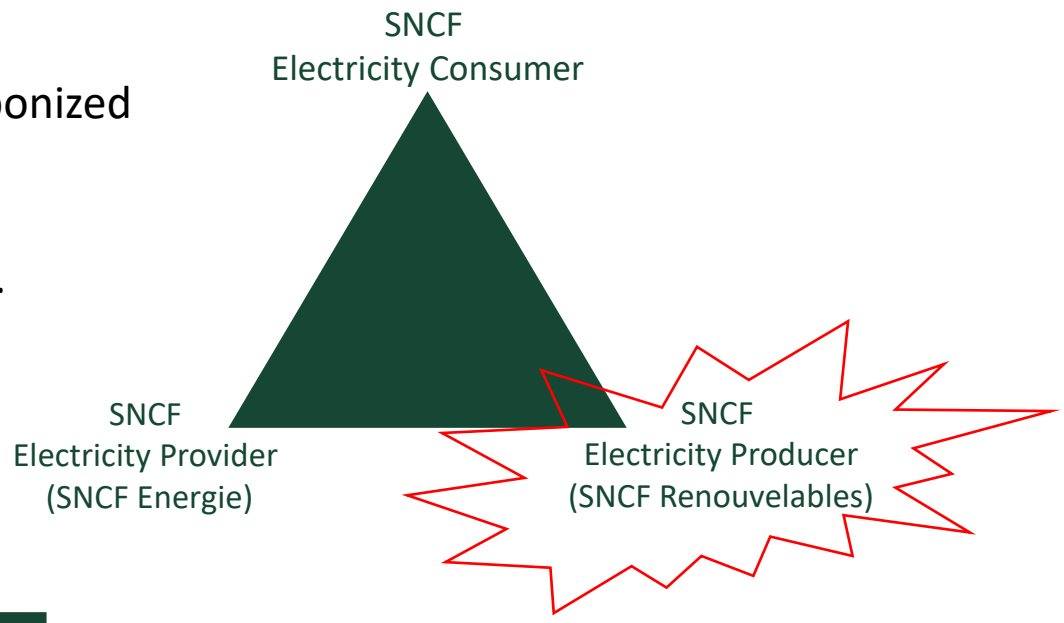
RENEWABLE ENERGY, A DECARBONIZATION LEVER FOR SNCF

The context

- SNCF, the 1st industrial electricity consumer
- SNCF Group, second landowner and second property owner in France.

An idea

- Enhancing unused assets (land and property) by generating decarbonized electricity
- SNCF was a producer through the Société Hydroélectrique du Midi (SHEM, sold in 2007), with dams located in the Alps and the Pyrenees.



Cover the entire value chain of electricity

SNCF Renouvelables : created at the end of 2023, it's a 100% SNCF subsidiary

- Main mission: deploy photovoltaic power plants on the land of the company to meet part of the Group's electricity increasing requirements
- Goal: 1000MWc currently adjusted – a very ambitious goal, in a new field for the company – a start-up from scratch

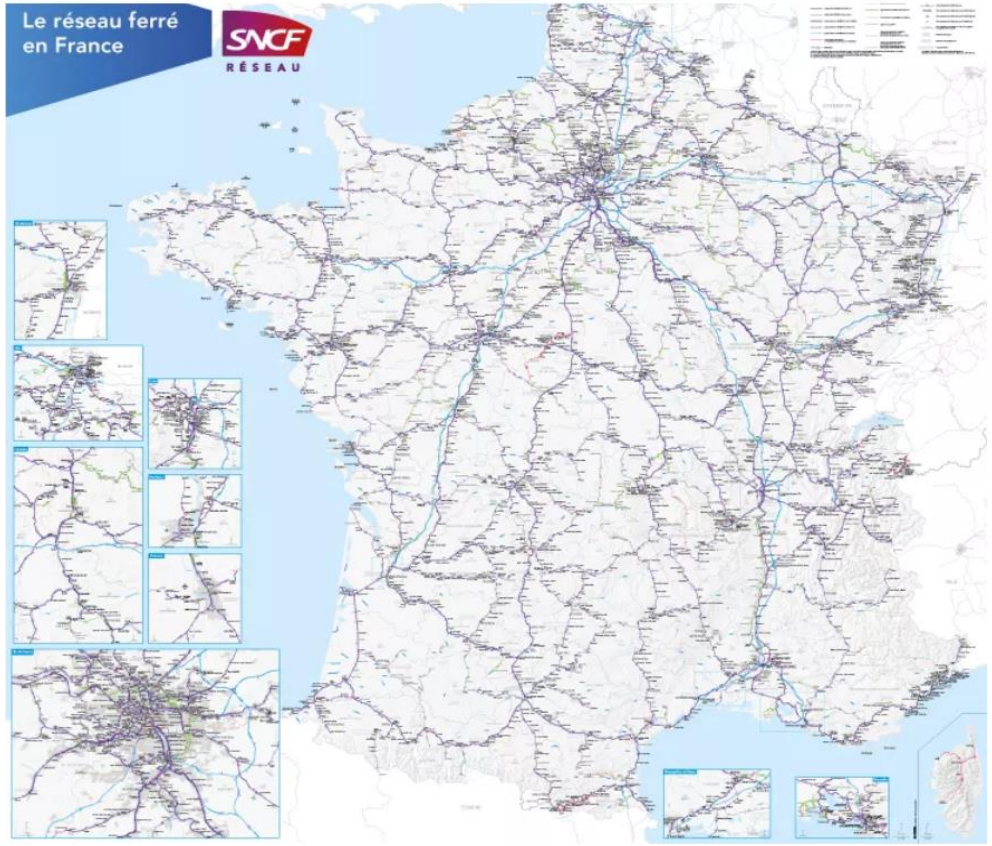
SNCF Renouvelables

LAND, THE FOUNDATION OF ALL DEVELOPMENT

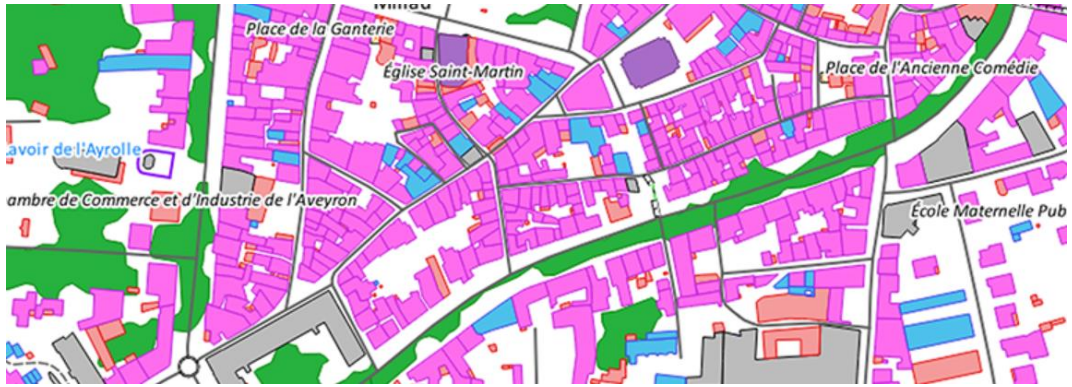
The initial playground
- 110,000 hectares (80,000 dedicated to the tracks)
- 13 million square meters
- Legal and technical complexities : safety,

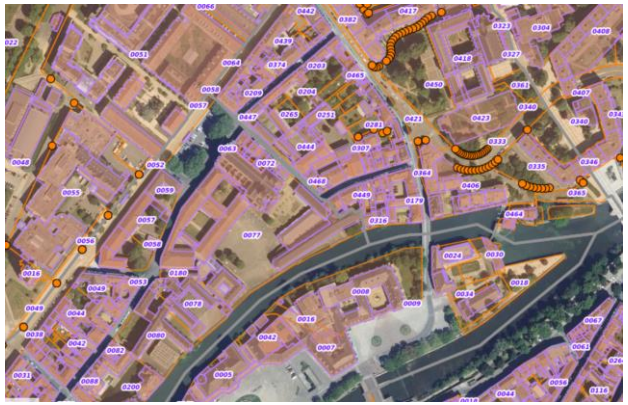
Solar Cadastre 1.0
- SNCF Data
- Open access data (networks, geography, weather, etc…)
- Multiple processing steps: distance to the track, vegetation, orientation, network distance, shape, etc.
- Deliverable: XLS file

The french railway network



Several open access data





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The defaults of the cadastre 1.0

- Outdated or incorrect data
- Too strict restrictions (very limited view of the land)
- Deliverable ergonomics (an xls file)

Results

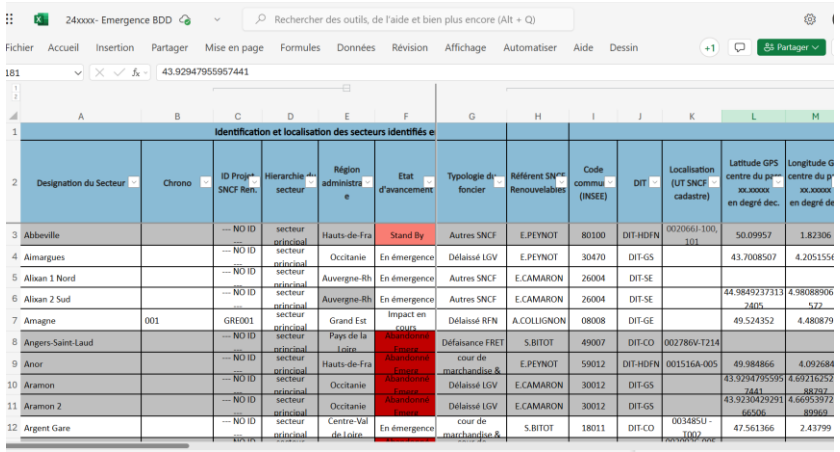
- Uncertainties regarding the true potential, disappointment, and unforeseen complexity
- Other development projects, restitution to the former owner, agriculture and other classifications (local urban plan), environmental compensation

Despite this,

- 50 feasibility studies and 15 environmental impact assessments were able to be launched

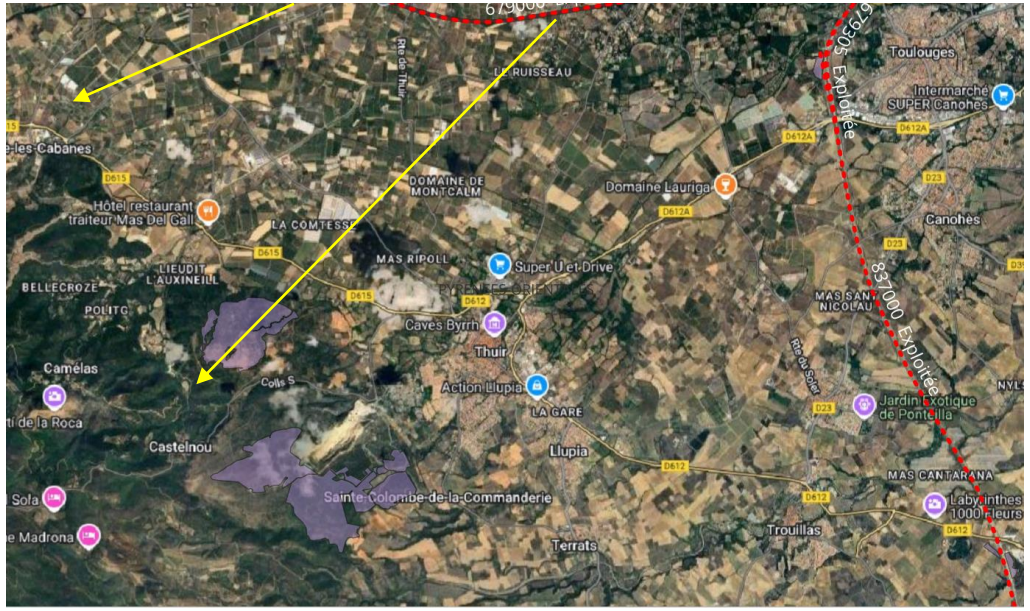
- It was also a valuable learning experience

The cadastre 1.0 : xls file



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Identification et localisation des secteurs identifiés e												
2	Designation du Secteur	Chrono	ID Projet SNCF Ren.	Hierarchie du secteur	Région administrative	Etat d'avancement	Typologie du foncier	Référent SNCF Renouvelables	Code commune (INSEE)	DIT	Localisation (UT SNCF cadastre)	Latitude GPS centre du projet xx.xxxxx en degré dec.	Longitude GPS centre du projet xx.xxxxx en degré de
3	Abbeville		--- NO ID ---	secteur principal	Hauts-de-Fra	Stand By	Autres SNCF	E.PEYNOT	80100	DIT-HDFN	002066J-100, 101	50.09957	1.82306
4	Aimargues		--- NO ID ---	secteur principal	Occitanie	En émergence	Délaissé LGV	E.PEYNOT	30470	DIT-GS		43.7008507	4.2051556
5	Alixan 1 Nord		--- NO ID ---	secteur principal	Auvergne-Rh	En émergence	Autres SNCF	E.CAMARON	26004	DIT-SE			
6	Alixan 2 Sud		--- NO ID ---	secteur principal	Auvergne-Rh	En émergence	Autres SNCF	E.CAMARON	26004	DIT-SE		44.9849237313 2405	4.98088906 572
7	Amagne	001	GRE001	secteur principal	Grand Est	Impact en cours	Délaissé RFN	A.COLLIGNON	08008	DIT-GE		49.524352	4.480879
8	Angers-Saint-Laud		--- NO ID ---	secteur principal	Pays de la Loire	Abandonné Envoi	Défaisance FRET	S.BITOT	49007	DIT-CO	002786V-T214		
9	Anor		--- NO ID ---	secteur principal	Hauts-de-Fra	Abandonné Envoi	cour de marchandise &	E.PEYNOT	59012	DIT-HDFN	001516A-005	49.984866	4.092684
10	Aramon		--- NO ID ---	secteur principal	Occitanie	Abandonné Envoi	Délaissé LGV	E.CAMARON	30012	DIT-GS		43.9294795595 7441	4.69216252 88297
11	Aramon 2		--- NO ID ---	secteur principal	Occitanie	Abandonné Envoi	Délaissé LGV	E.CAMARON	30012	DIT-GS		43.9230429291 66506	4.66953972 89969
12	Argent Gare		--- NO ID ---	secteur principal	Centre-Val de Loire	En émergence	cour de marchandise &	S.BITOT	18011	DIT-CO	003485U - T002	47.561366	2.43799

Agricultural land, environmental offset area



Key points: data and local knowledge (upcoming projects, various interests...)

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Solar cadastre 2.0

Revision of criteria: broader and more business-oriented
More structured approach: by track and department
Deliverable: a QGIS GIS tailored to the activity

Prospecting (to locate sites meeting specific requirements)

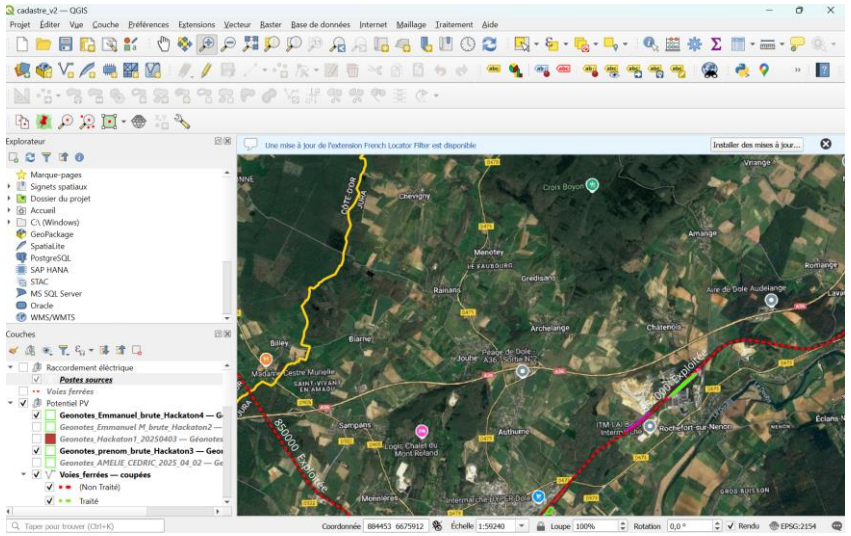
- Update of SNCF data
- Data from infrastructure managers
- To be completed: other SAS
- Provide notes with evaluation criteria (shape, land unit, orientation, slope, high-speed line, surface area, environmental compensation, etc.)

⇒ **merit order**

Emergence (confirm the site's value)

- Challenge/complete the notes: projects, local urban plans (PLU), local public policies
- Go/No-Go Feasibility : technical evaluation

The cadastre 2.0 : GIS screen



A potential project site

Due to the frequent adjacency to railway infrastructure, the sites are subject to significant technical constraints, and their configurations are often non-standard, typically consisting of elongated and narrow land parcels

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If Go and Feasibility are confirmed, proceed to securing :

- Business plan : update the projects portfolio, evaluate the financial input and output…
- Legal status : site to be declassified from the public domain or site to be maintained in the public domain with specific legal constraints
- Secure the intended use of the site : estimation and establishment of a lease commitment

Although the land is managed by SNCF, the technical and administrative matters are lengthy and complex

If the project is approved :

- a 25 to 30-year emphyteutic lease
- by including ancillary areas related to operations, environmental compensation, and landscaping considerations

As the sites are still located near railway facilities, it seems important to consider reversibility in order to restore them to a railway use.