

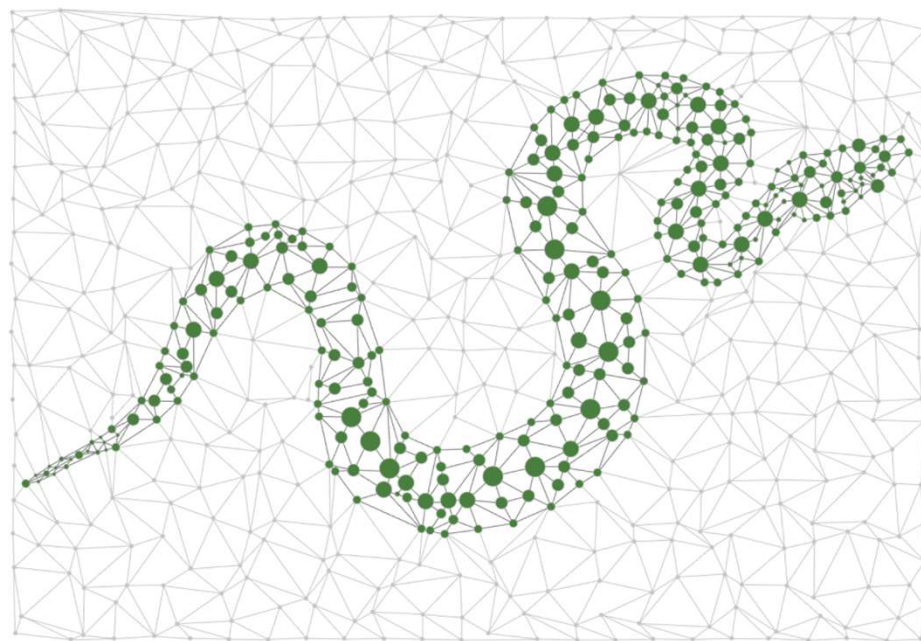


eFlower CO2 Forecast
22.03.2023

<https://eflower.io>

The leading provider for
electricity impact data

WIDE COMPETENCES FOR THE ENERGY TRANSITION



eFlower

In partnership with Pythonian

- IT developers
- Statisticians
- Meteorologists
- Hydrologists
- Power market experts

OUR PRODUCTS



Timeseries Refinery

An Open Source data management platform to collect, clean, assemble time series, automate tasks and model calculations, calibration and backtesting.



Data Forecast

An API for B2B as a tool to access weather forecast, power price forecasts, marginal technology forecast and marginal CO₂ forecasts for demand response



CO₂ Electricity forecast

(Demonstrator)

A mobile APP to help B2C customers modify consumption behaviour

eFlower CO₂ emission forecast

WHY ?

AT THE HEART OF OUR SOLUTIONS, AN OBSERVATION :

Wind & solar production have changed the game !

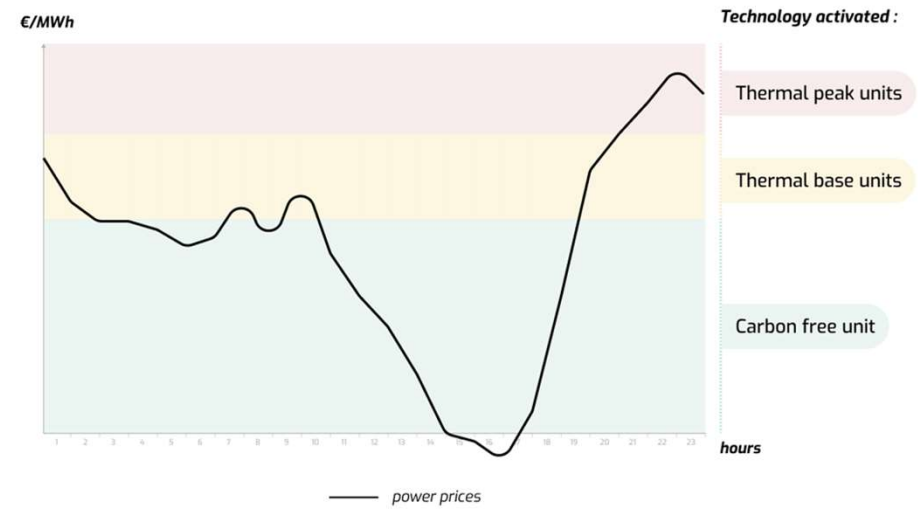
CO2 Forecast model



Before

eFlower

CO2 Forecast model



Now

ECONOMICAL INCENTIVES HAVE LIMITS

1. End **consumers** are mostly **not exposed to dynamic pricing in EU**

*Classical **peak / off-peak pricing are obsolete** with increasing wind and solar production.*

2. Consumers **cannot manage highly volatile prices**, it **frightens**, lack of **pedagogy, technology, services & trust**.

3. The **majority of consumers are not exposed to prices at all !**

Ex :In households there is only 1 person responsible for the bill ... who generally doesn't even know his electricity cost

eFlower CO₂ emissions

B2C use case



A BUSINESS OPPORTUNITY

- High incentive in carbon reduction for behaviour changes.
- strong correlation between wholesale market prices and marginal CO₂ emissions.
- Methodology is « Dynamic Pricing » ready
- Consumers who modify their behavior are cheaper



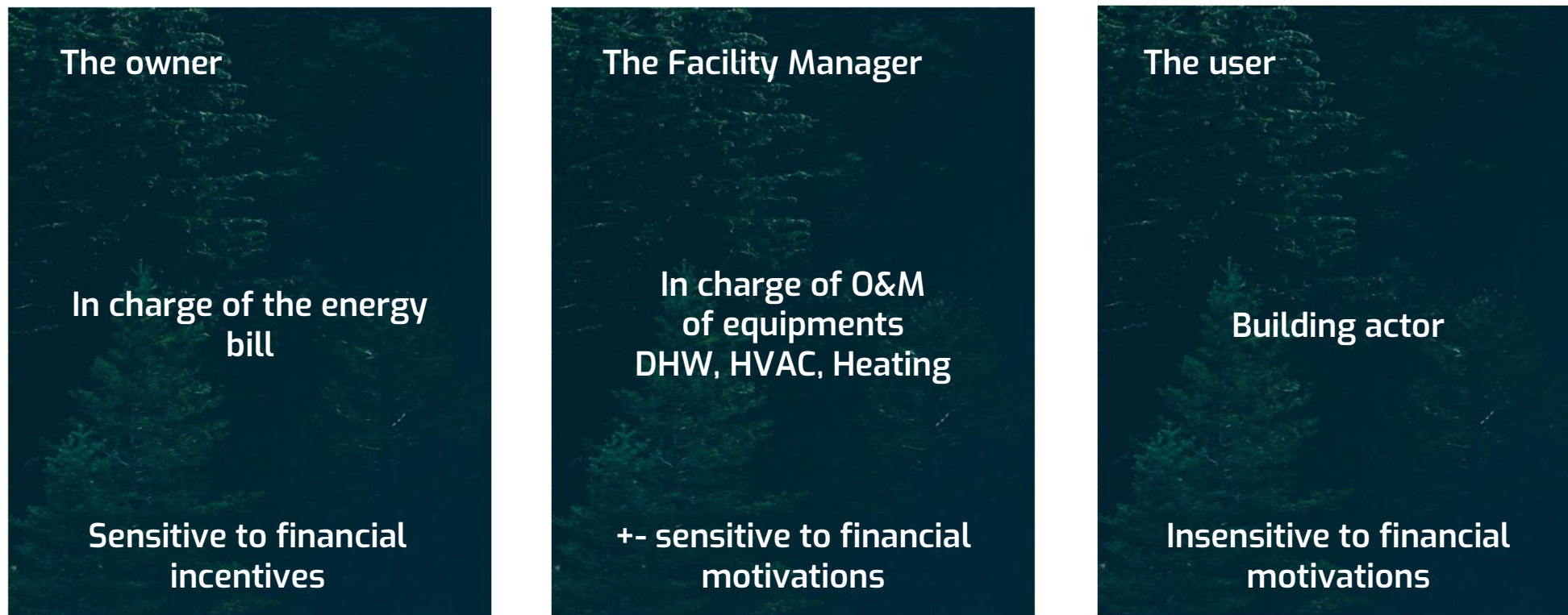
ENGIE Trusts us

eFlower CO₂ emissions
B2B use case



BUILDINGS: A MULTILEVEL ECOSYSTEM

The environmental communication from eFlower aligns the interests of the whole ecosystem.



Reference : OPTIMIZING THE CONSUMPTION OF A COMPANY

Reference :

Company in Belgium

Study over 46 days

Consumption of 700 kWh on average (6GWh/year)

Equipped with solar panels

Wholesale power market price

Electric consumption

Estimated opportunity:

(Cal 24 @ 22/02/2023 = 133,85 €/MWh)

- 344 k€/year on an energy share of 1,1 M€/year

- 313 tons CO₂ / year on pillar B

Optimized electricity consumption

Prix élec marché																							
Moyenne de 20 Etiquettes de colonnes																							
Étiquettes de 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Moyenne générale
11/05/2022	207	193	196	179	184	216	213	224	200	147	96	59	183	83	40	104	144	219	232	208	206	189	151
12/05/2022	141	141	141	138	146	172	211	221	221	221	221	221	221	221	221	221	221	221	221	221	221	221	176
13/05/2022	210	203	189	174	174	203	242	242	228	177	129	49	45	1	237	39	181	120	211	229	217	184	166
14/05/2022	171	101	102	146	167	178	184	184	185	163	93	85	71	2	44	69	80	106	225	240	242	239	155
15/05/2022	218	196	185	174	170	170	180	220	244	241	201	159	151	111	90	75	45	20	40	40	40	148	148
16/05/2022	180	189	178	170	170	180	230	240	235	211	211	200	185	157	68	68	72	100	246	256	278	260	180
17/05/2022	203	196	189	185	189	207	237	245	242	242	242	242	242	242	242	242	242	242	242	242	242	242	220
18/05/2022	268	186	176	174	170	180	220	244	241	201	159	151	111	90	75	45	20	40	40	40	148	148	203
19/05/2022	187	185	178	178	185	222	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	256	209
20/05/2022	211	196	188	188	200	231	260	250	248	205	157	150	145	189	109	109	109	109	109	109	109	109	166
21/05/2022	136	113	108	108	108	108	111	140	150	154	124	108	94	98	92	127	151	146	101	119	128	104	136
22/05/2022	187	179	170	170	167	167	160	150	138	138	134	150	101	101	101	133	157	195	213	226	228	201	166
23/05/2022	176	165	159	158	158	173	201	225	230	231	231	231	231	231	231	231	231	231	231	231	231	231	191
24/05/2022	161	183	183	183	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184	184	171
25/05/2022	195	180	178	178	178	211	230	212	187	134	114	113	113	113	113	116	149	169	205	209	180	145	159
26/05/2022	188	19	11	16	11	71	80	67	40	60	23	40	20	20	20	20	20	20	20	20	20	20	51
27/05/2022	17	26	19	14	44	84	93	122	74	67	3	0	0	0	0	0	0	0	0	0	0	40	
28/05/2022	188	103	116	104	104	112	105	86	52	32	13	0	0	0	0	0	0	0	0	0	0	79	
29/05/2022	179	148	148	140	141	136	138	140	140	145	141	134	133	132	132	130	180	901	115	105	105	159	
30/05/2022	204	185	185	188	186	211	258	261	231	215	208	201	202	211	226	241	191	299	396	248	224	226	
31/05/2022	200	188	187	188	188	196	220	240	241	230	188	191	184	173	182	182	205	247	253	248	208	228	
01/06/2022	200	207	189	184	188	189	200	250	246	229	211	207	188	189	189	190	202	228	248	240	200	215	
02/06/2022	191	175	180	166	166	170	210	221	188	170	158	147	148	155	171	217	239	239	239	239	239	184	
03/06/2022	178	163	167	160	160	170	200	205	164	148	138	133	122	136	139	158	140	149	129	149	138	166	
04/06/2022	176	168	167	156	156	160	180	174	161	156	142	139	125	125	125	135	195	209	189	163	144	144	
05/06/2022	180	143	121	110	127	127	134	134	141	144	134	134	132	132	130	183	369	369	369	369	369	100	
06/06/2022	109	89	83	88	86	90	75	84	58	56	29	47	52	66	44	88	56	170	201	214	217	67	
07/06/2022	156	160	148	148	148	156	176	217	220	211	191	175	169	169	164	164	173	200	217	229	201	183	
08/06/2022	185	189	185	185	185	177	187	214	215	205	191	177	180	170	155	155	168	171	203	212	211	188	
09/06/2022	189	171	165	158	157	168	215	208	193	161	146	144	133	135	137	149	193	200	210	209	187	175	
10/06/2022	197	178	165	166	166	170	208	214	213	184	172	157	147	148	143	145	177	189	217	201	205	181	
11/06/2022	203	188	178	160	160	160	121	125	65	8	1	0	0	0	0	0	0	0	0	0	0	107	
12/06/2022	198	172	165	154	152	143	120	81	70	30	12	0	0	0	0	0	0	0	0	0	0	115	
13/06/2022	176	168	159	147	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	140	119	
14/06/2022	191	186	180	180	187	171	215	228	205	182	166	162	178	172	174	204	211	240	241	241	219	196	
15/06/2022	198	184	178	173	184	217	247	254	225	182	165	160	169	169	168	216	205	203	215	218	201	171	
16/06/2022	219	217	217	210	200	242	251	298	252	218	208	199	191	166	209	209	208	980	100	240	243	239	
17/06/2022	300	271	203	203	200	222	323	326	282	242	208	228	196	226	224	201	101	128	359	310	203	268	
18/06/2022	276	261	240	248	211	230	211	225	206	196	167	147	139	138	198	187	205	308	310	249	205	232	
19/06/2022	207	190	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	166	161	
20/06/2022	240	200	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	219	200	
21/06/2022	271	230	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	216	203	
22/06/2022	268	244	240	255	254	322	358	393	327	274	228	218	208	201	297	360	441	399	243	243	243	205	
23/06/2022	285	264	259	266	250	320	381	374	364	305	258	270	281	293	289	341	429	414	344	344	344	315	
24/06/2022	290	275	267	260	259	310	380	386	386	314	254	259	251	268	286	286	286	286	286	286	286	286	
25/06/2022	261	237	231	238	238	227	241	269	241	226	217	217	229	219	221	241	269	274	314	327	328	285	
Moyenne générale																						184	

Conso Elec Grid horaire																								
Somme de 20 Etiquettes de colonnes																								
Étiquettes de 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total général	
11/05/2022	845	854	842	840	837	867	808	733	839	811	762	229	247	349	482	566	605	806	936	934	907	964	876	16594
12/05/2022	953	908	893	894	889	814	650	509	457	559	396	457	564	543	627	729	840	913	946	928	884	870	17115	
13/05/2022	970	873	899	864	894	810	677	588	499	441	318	311	418	382	644	805	854	951	952	936	936	882	16694	
14/05/2022	850	840	830	795	821	741	625	488	353	359	163	167	232	352	463	575	700	801	820	830	831	836	14611	

GEOGRAPHIC COVERAGE



Marginal CO₂ emission forecast for demand response across 12 countries in Europe

FR, BE, NL, DE, AT, DK, ES, IT, HU, CH, GR, PT

Power systems are screened daily by automatic algorithms to produce best forecast estimations of marginal CO₂ emissions

eFlower Model

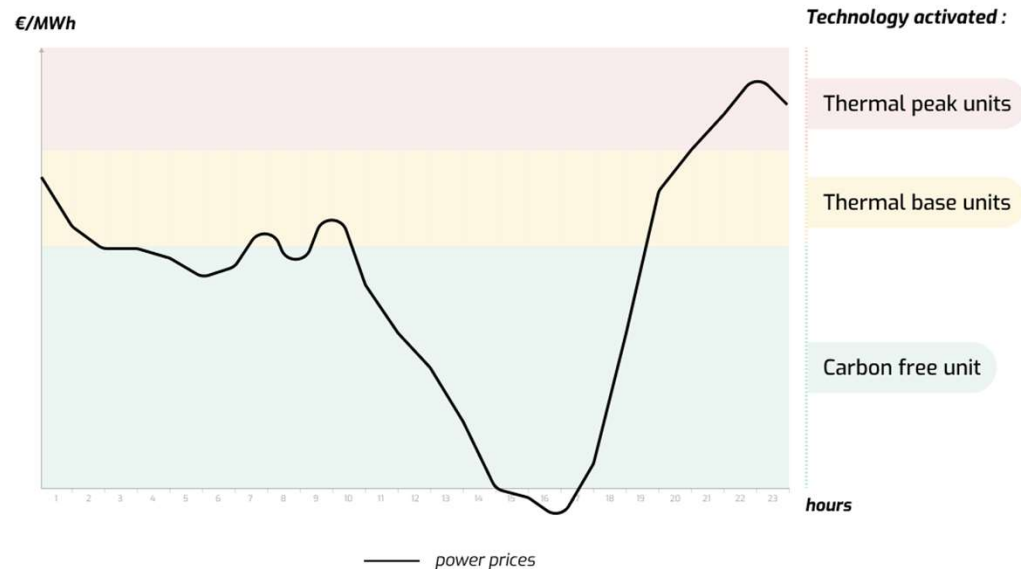
HOW ?



MARGINAL CO2 EMISSIONS DERIVED FROM A MARKET BASED MODEL

Replicating the dispatch decision process to identify the marginal technology guarantees the coherence of **correct environmental incentives with the interests of the grid and overall economy.**

CO2 Forecast model

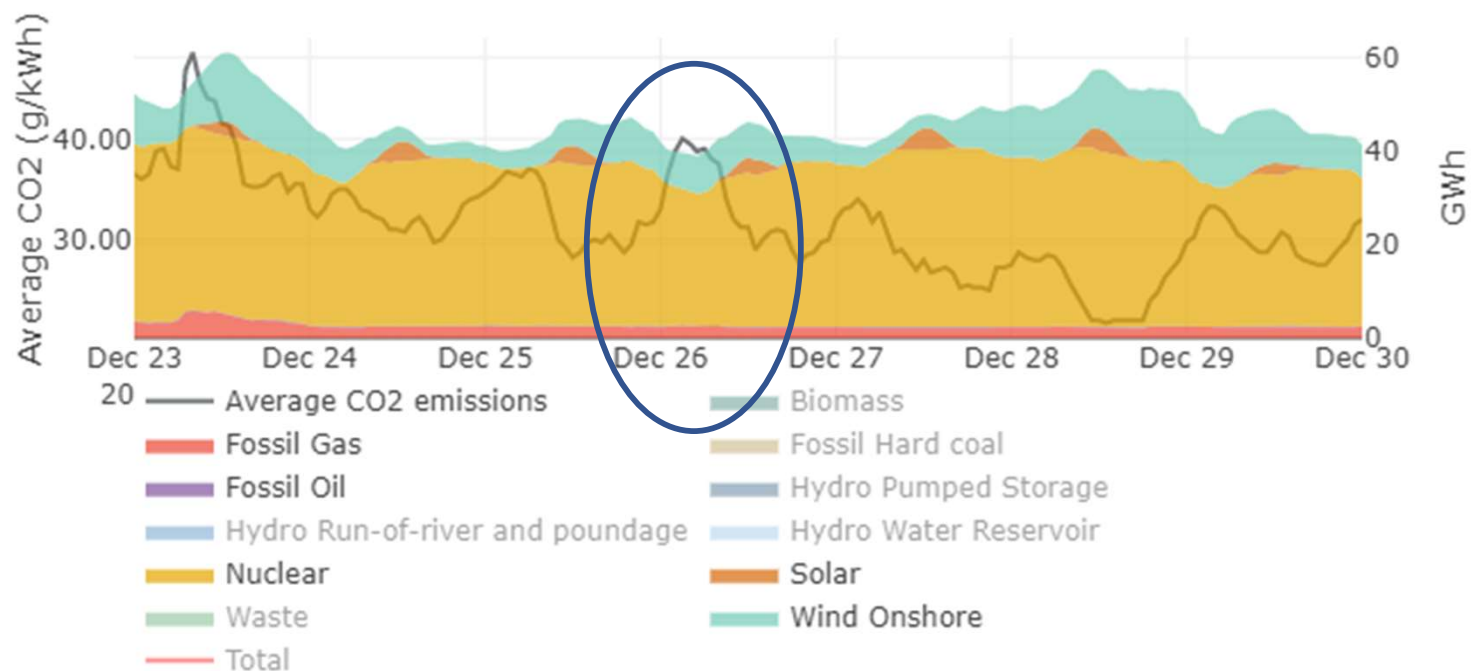


MARGINAL CO2 EMISSIONS DERIVED FROM A MARKET BASED MODEL

Average CO2 emission forecast cannot be used as incentive for Demand Response

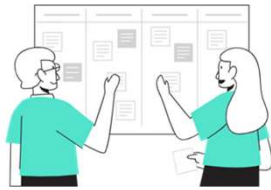
(RTE/Electricity MAP/BARRY are confusing incentives)

hourly CO2 Emissions Model Comparison France



eFlower
B2C communication

METHODOLOGY COMPATIBLE WITH 100% GREEN SUPPLY



Supplier's efforts

Power provided from
100% renewable
energy

+



Consumer's efforts

Behaviour change with
impact on the global
power system

=



< Emission Reductions

Avoided CO₂ emissions

METHODOLOGY COMPATIBLE WITH 100% GREEN SUPPLY



Supplier's efforts

+



Consumer's efforts

=



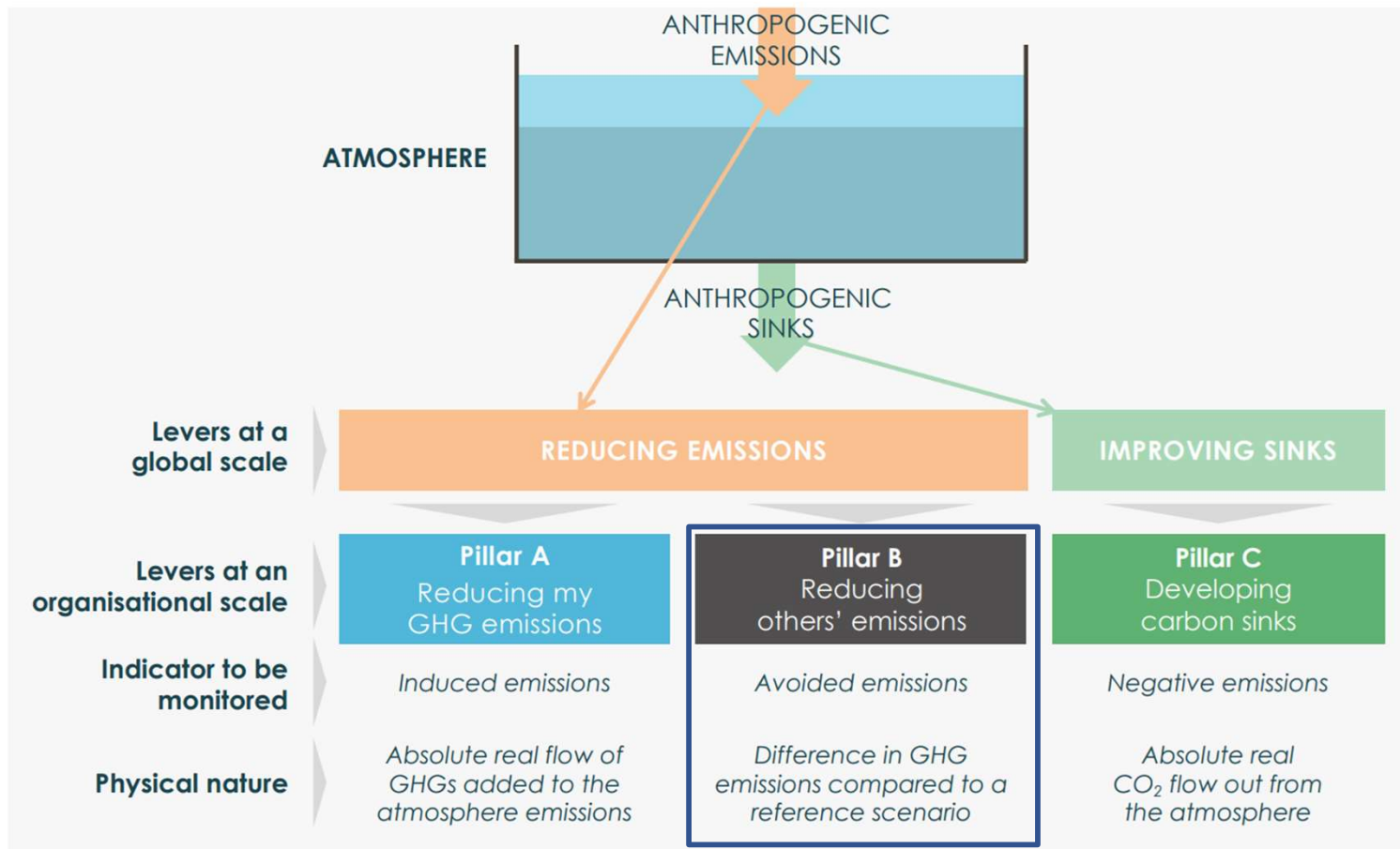
< Emission Reductions



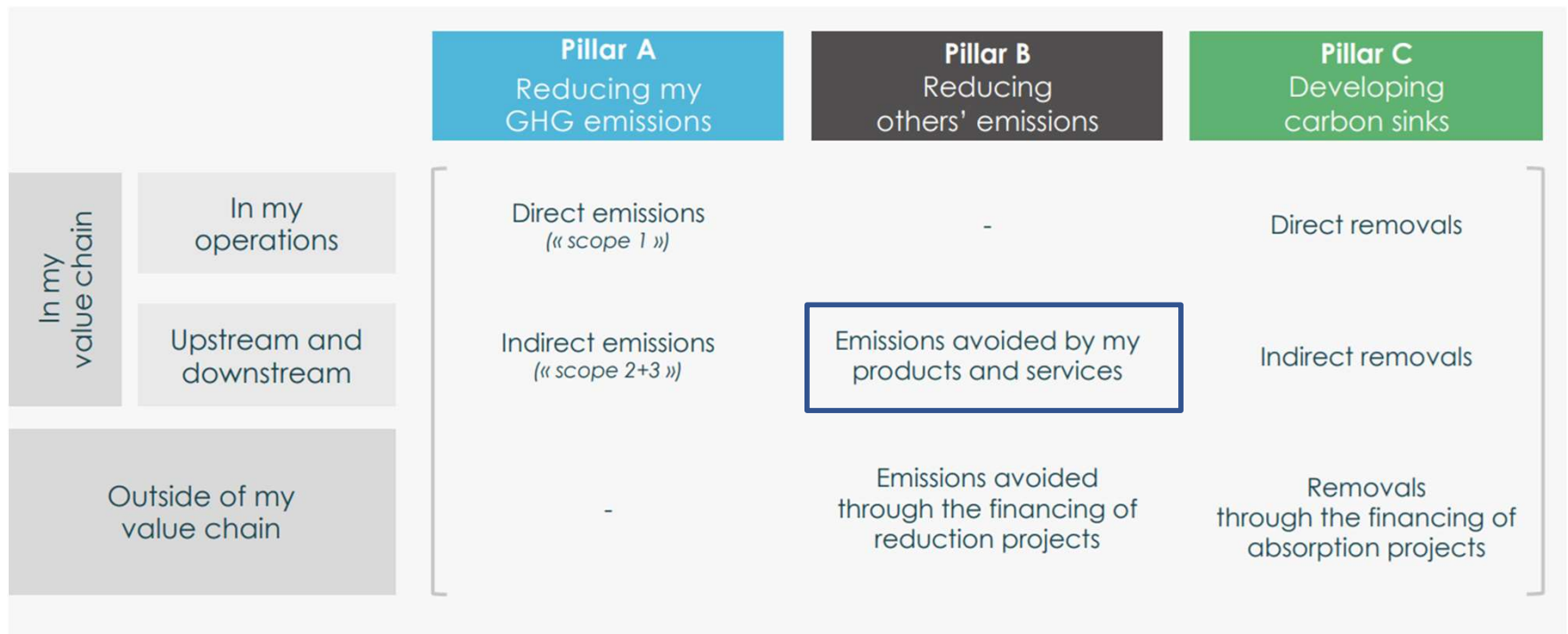
When renewable power is not consumed it is nevertheless injected in the power system and help reduce carbon emissions from the power system

eFlower
B2B extra-financial communication

CO₂ Reporting on Pillar B of Net Zero methodology



CO₂ Reporting on Pillar B of Net Zero methodology



EXAMPLE

Reference :
 system average CO2 emission (FR) = 50 g/kWh
 marginal CO2 emission (CCGT) = 350 g/kWh



Situation 1: total consumption = 10 kWh



Situation 2: total consumption = 9 kWh

GHG Protocol

+

eFlower reporting

=

Global CO2 impact

500 g CO2 (= 10 x 50)

- 0 g CO2 (= - 0 x 350)

500 g CO2

450 g CO2 (= 9 x 50)

- 350 g CO2 (= -(10 - 9) x 350)

450 g CO2 "Induced" *Pillar A*
Mandatory GHG standard

- 350 g CO2 "Avoided" *Pillar B*
Voluntary basis

Why us?



Good for your clients

Highly empower their efforts with concrete feedback



Good for your business

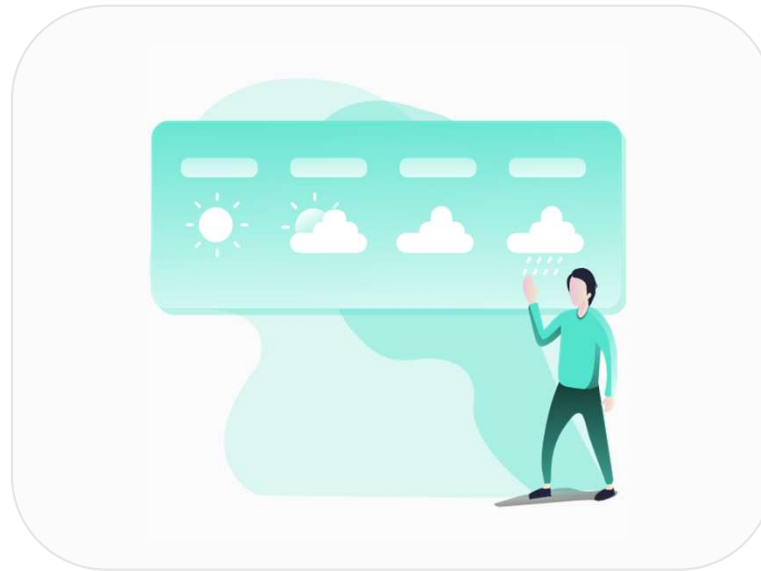
Improve your power sourcing and valorize the flexibility



Good for the planet

Onboard all the stakeholders behind a common goal

CONTACT



marc.schicks@eflower.io

+33 6 87 14 60 11

<https://eflower.io>