

International Teaching Adaptation to Pandemic and Sustainability Constrains

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Engineer School SPEIT in Shanghai

In Chinese: 上海交通大学巴黎卓越工程师学院

In French: Ecole d'Ingénieurs Paris SJTU

In English: SJTU Paris Elite Institute of Technology

Abbreviation: SPEIT



上海交通大学巴黎卓越工程师学院
Ecole d'Ingénieurs Paris SJTU

Created by Shanghai Jiao Tong University & 4 French Engineer Schools

Mines Paris (PSL University)

Ecole Polytechnique (Institut Polytechnique de Paris - IPP)

Telecom Paris (Institut Polytechnique de Paris - IPP)

ENSTA (Institut Polytechnique de Paris - IPP)

Created in 2012

Inaugurated on 26th April 2013



Engineer School SPEIT in Shanghai

The French touch and concept of SPEIT:

hiring Chinese students for a 6-year cursus

intensive French language learning

French teaching contents and methods (projects, controversy,...)

65% teachers from the 4 French schools come on Shanghai campus

venue of Chinese students on French campuses

large participation of industry: teaching, internship, jury, sponsoring
a research year to fulfill Chinese requirements of education

Students obtain one of the three Masters of SJTU at the end in:

Energy Power Engineering

Information Engineering

Mechanical Engineering

Diploma are habilitated by the Commission des Titres d'Ingénieur (CTI)

Teaching Carbon Balance

Energy Power Engineering: scales of carbon balance

The French touch includes teaching of methods of GHG Balance

CO2 emissions of countries; by activities; Kaya's equation

National inventories & Carbon footprint accounting of exports/imports

Carbon footprint of Organization or Territories

The three scopes of ADEME's method

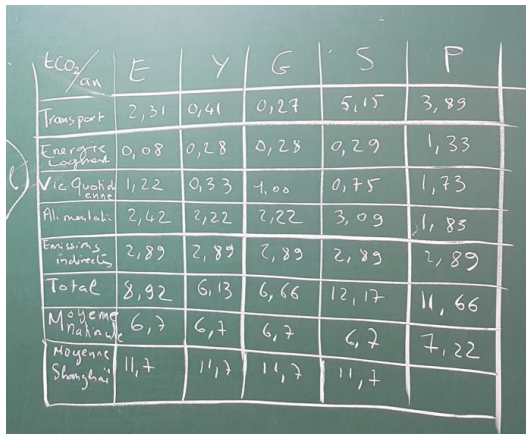
The data basis use for Carbon Footprint of products and services

Examples in industry

Carbon footprint of an individual as a function of the way of living

MyCO2 or Datagir websites

2019 before Covid in presence – 2022 after Covid at distance



tCO ₂ /cap	E	Y	G	S	P
Transport	2,31	0,41	0,27	5,15	3,89
Energy Logement	0,08	0,28	0,28	0,29	1,33
Vie Quotidienne	1,22	0,33	1,00	0,75	1,73
All. mobili.	2,42	2,22	2,22	3,09	1,85
Emissions indirectes	2,89	2,89	2,89	2,89	2,89
Total	8,92	6,13	6,66	12,17	11,66
Moyenne Nationale	6,7	6,7	6,7	6,7	7,22
Moyenne Shanghai	11,7	11,7	11,7	11,7	

Initiale French First Name	Alimentation	Transports	Logement	Services Publics	Divers	Numérique	TOTAL
C	2,6	1,7	1,1	0,71	0,33	0,16	6,6
Rpl	2,9	0,55	0,26	1,1	0,49	0,21	5,6
Y	2,7	1,6	1,1	0,46	0,41	0,3	6,6
J	2,8	0,49	0,34	1,1	0,08	0,05	4,9
A	2,4	2,2	1,1	0,42	0,26	0,06	6,4
V	2,9	3,2	0,43	1,1	0,3	0,08	8
Rld	2	1,7	2,9	1,1	0,68	0,19	8,7
O	1,7	0,34	1,3	1,1	0,4	0,27	5,1
Rbt	3,3	1,1	0,52	1,1	0,61	0,21	6,8
T	3,8	0,2	4,1	1,1	0,34	0,05	9,6
Moyenne	2,7	1,3	1,3	0,9	0,4	0,2	6,8
Prof	2,8	2,6	2,2	1,1	0,64	0,22	9,6

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SPEIT Carbon Balance: ADEME method (before COVID)

Introduction SPEIT

- École d'ingénieur de SJTU-ParisTech (*SJTU ParisTech Elite Institute of Technology*, SPEIT) fondée en 2012
- Située en banlieue de la ville de Shanghai, Chine

Année scolaire 2016 - 2017

Élève	398
Permanent chinois	35
Permanent français	15
Professeur externe	41
Total	489



Méthode d'ADEME de bilan carbone

Scope 1

1. Emissions directes des sources fixes de combustion
2. Emissions directes des sources mobiles à moteur thermique
3. Emissions directes des procédés hors énergie
4. Emissions directes fugitives
5. Emissions issues de la biomasse (sols et forêts)

Scope 2

6. Emissions indirectes liées à la consommation d'électricité
7. Emissions indirectes liées à la consommation de vapeur, chaleur ou froid

Scope 3 calculé

8. Emissions liées à l'énergie non incluse dans les catégories « émissions directes de GES » et « émissions de GES à énergie indirectes »
9. Achats de produits ou services
13. Déplacements professionnels
16. Transport de visiteurs et de clients
22. Déplacements domicile travail
23. Autres émissions indirectes

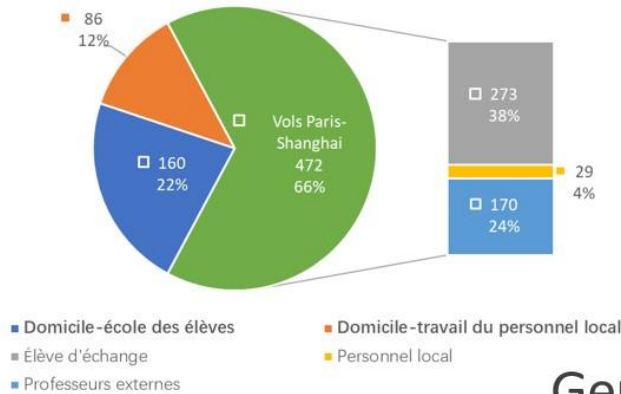
Scope 3 non calculé

10. Immobilisations de biens
11. Déchets
12. Transport de marchandise amont
14. Actifs en leasing amont
15. Investissements
17. Transport de marchandise aval
18. Utilisation des produits vendus
19. Fin de vie des produits vendus
20. Franchise aval
21. Leasing aval

SPEIT Carbon Balance: ADEME Method before Covid

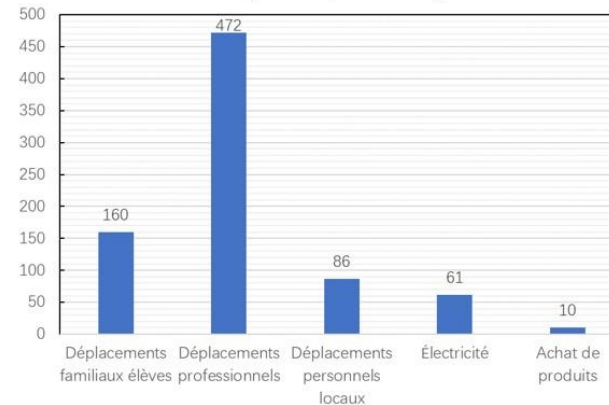
Summary Mobility Emissions (tCO₂/y)

Transport (Année 2016-2017)



General balance: 789 tonnes CO₂e/an

Émission totale de SPEIT par poste de l'année 2016-2017 (tonne équivalent CO₂)



Improving the Carbon Balance before and during COVID

Save power+Double Glazing+LED+Standby+...

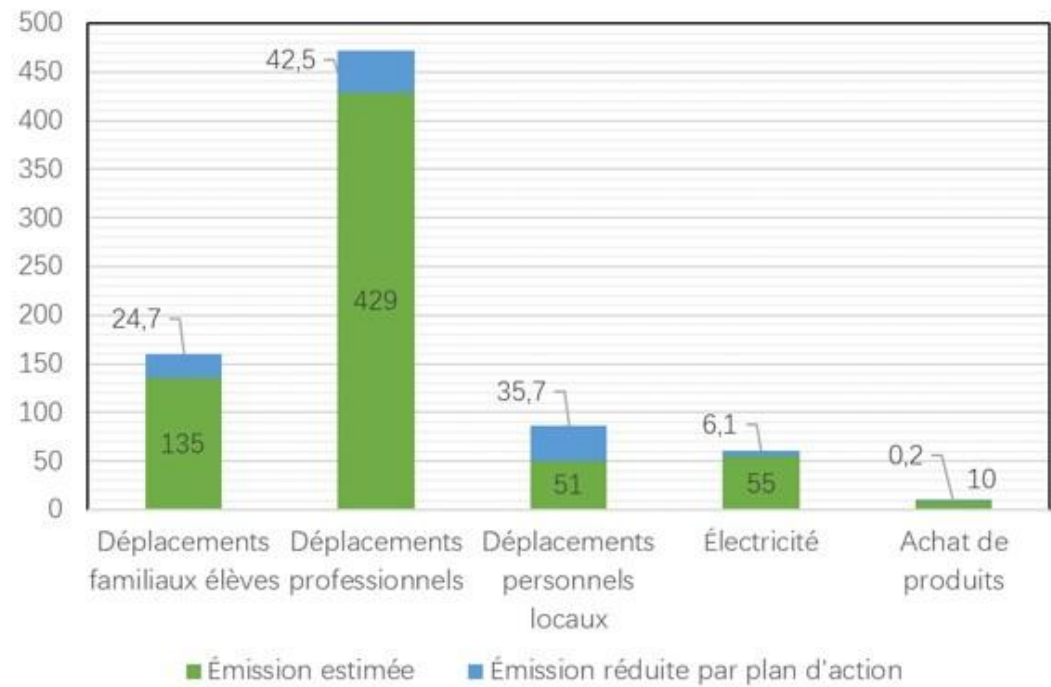
House to work journey of students and locals in public transports

Transfer of some teaching tasks to local teachers vs French

New technologies: e.g. MOOC

Students: fast trains vs cars

Émission totale de SPEIT de l'année 2016-2017 en adoptant le plan d'action (tonne équivalent CO₂)



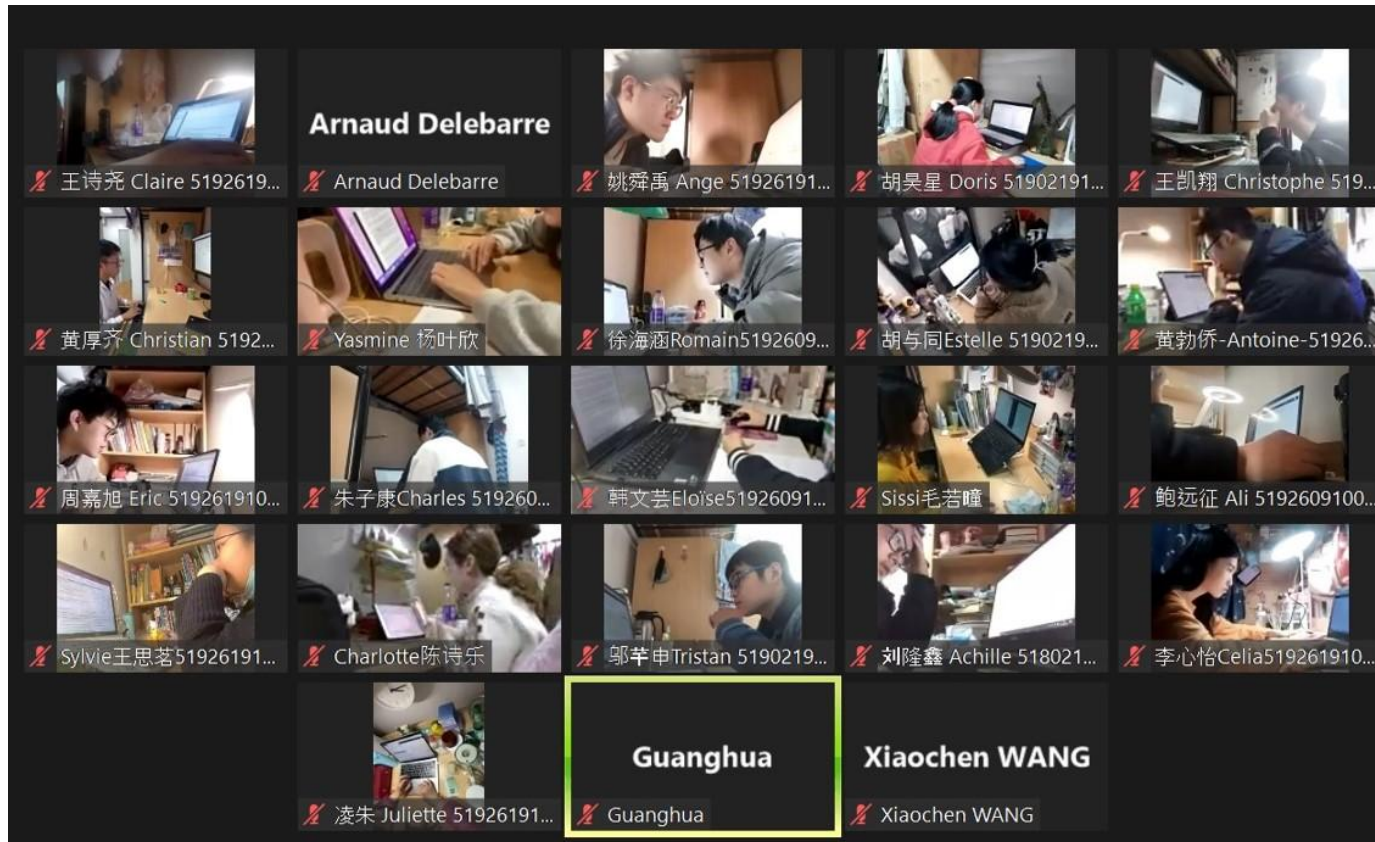
Improving the Carbon Balance before and during COVID

Students often confined in dormitorium ; some in France: semester & double diploma

All French teacher journey France-Shanghai canceled (cost+quarantine issue)

Course of French teachers by Zoom sessions + MOOC + Project Work

1.5 kg CO₂eq/hr of videoconference ; 6 to 157 gr CO₂eq/hr.user, video off or on



Issues to addressed in SPEIT during COVID

Exchanges of students between China and France maintained:

SPEIT model at least 1 semester in France. Student demand & CTI criteria

Motivation and/or objection/resistance/activism of teachers:

Remuneration by displacements (per diem) changed in wages from China

Remuneration from China incompatible with some statutory rules and

Few resignations of teachers: disagreement/opponent to teaching at distance

Teacher faces a grid of black screen student (camera off and micro mute)

More project work: improving CTI's recommendations

Motivation and objection/resistance of students:

Good attendance to zoom courses: passive to active by method changes

Less passive attendance: more project work under teacher guidance with time. Spring Semester of 2020+Academic Years 20/21 and 21/22....

Less carbon but dehumanisation during 2.5 years: no colleague meetings ; no diploma ceremony ; PhD low recruitment.

Carbon or Covid ?

XI Jinping re-elected

Politic 0-Covid will remain or not: economical growth vs contamination

Jean-Marc Jancovici is used to say that to achieve the objectives of Paris agreement of 2015 (COP21):

We need a Covid every year, to reduce CO2/GHG emissions

Education certification and deployment

Extrapolation to international subsidiaries of establishment abroad

- CTI or equivalent certifications
- CO2 constrains if quotas or taxes or cost of travels increases

Extrapolation to national situation:

- university cannot afford power invoices
- students and families cannot afford costs of accomodation and tuition fees

A zero campus system for social and environmental reasons ?