HubstartParisRegion
GATEWAY TO BUSINESS, LINK TO THE WORLD

AEROTROPOLIS ATLANTA

9th Annual

Sustainable Areas Airport International Seminar

October 15-16, 2019

Atlanta, GA

Aerotropolis ATLANTA Community Improvement Districts

GIP EMPLOI Roissy CDG

GROUPE ADP

Hartsfield-Jackson Atlanta International Airport®

ARC ATLANTA REGIONAL COMMISSION

DAY 1

THE IMPACT

OF BIG DATA, TECHNOLOGY AND INNOVATION

TUESDAY OCT 15

AFTERNOON

1:00 - 3:15 PM PANEL I - USING BIG DATA AND NEW TECHNOLOGIES TO ENHANCE THE ENVIRONMENTAL SUSTAINABILITY IN AIRPORT AREAS

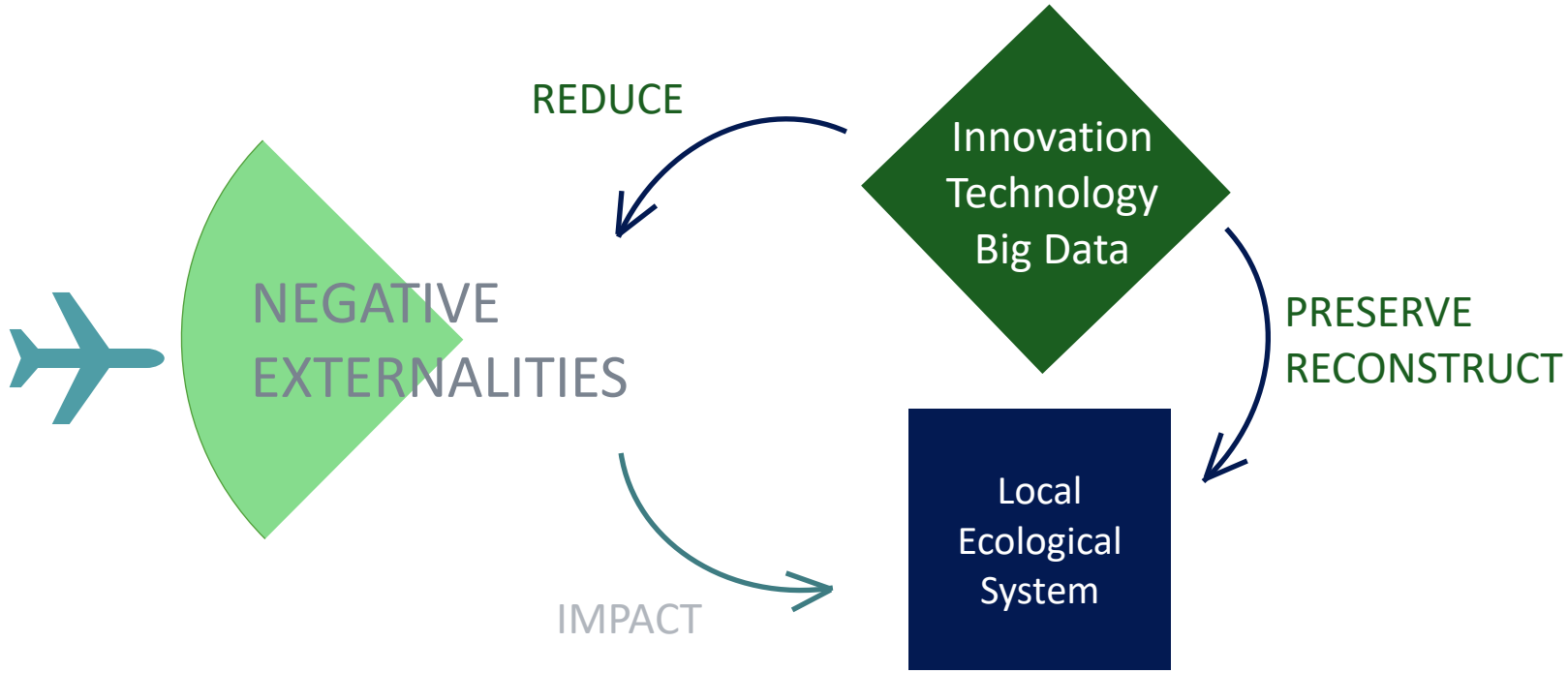
3:15 - 3:30 PM NETWORKING COFFEE BREAK

3:30 - 5:00 PM PANEL II - HOW BIG DATA AND NEW TECHNOLOGIES WILL IMPACT JOBS, SKILLS AND EDUCATION

END OF THE FIRST DAY

PANEL 1

Using Big Data and new technologies to enhance the environmental sustainability in airports areas



START-UPS
THEIR SOLUTIONS

Mme Charlène LAMBERT

Manager Solution

Evolution Energie

ISO 9001
ISO 14001
BUREAU VERITAS
Certification

Evolution Energie

Energy Management Software Solutions

Erwin GUIZOUARN, CEO
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+33 9 51 10 34 63

References

GROUPE ADP

Energy and Environment management software

Energy Management System

1 Data Collection

- Price data :
  - From market places (Montel, Bloomberg)
- Meter data :
  - From TSO
  - From scada systems

2 Technical Efficiency

- Multi utilities
- Action plans
- KPI
- Alerts
- Reporting (ex. ACA)
- Dashboard

3 Cost Efficiency

- Contracts management
- Bill checking
- Market operations
- Margin follow-up
- Risk assessment
- Reporting (ex. EMIR)

4 Auditability

- Energy transactions
- CO_2 emissions
- Green certificates
- Register for energy and environment

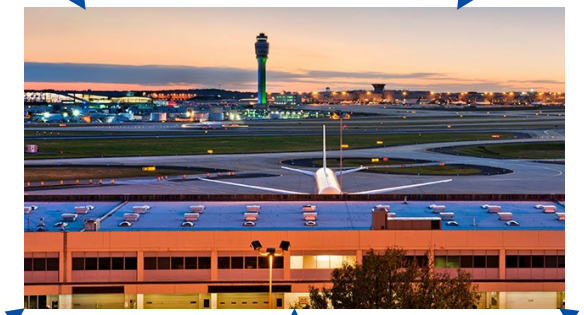
Evolution Energie

Our proposition for airports

Airport's needs

Different data's sources

Huge volume of data



Energy and environment efficiency follow up

Bill checking and money saving

Microgrid management

Our proposition

- Centralization of energy and environmental data
  - Multi commodities (power, gas, water, waste, CO_2, NO_x, vehicles, planes)
  - Influential factor (weather, surfaces, passengers)
- Energy efficiency follow up (KPI, Action plans, Alerts)
- Energy contract management
- Cost tracking and billing
- Microgrid optimization
- Dashboards
- Reporting (ACA)

Evolution Energie

www.evolutionenergie.com

charlene.lambert@evolutionenergie.com

PANEL 1

Using Big Data and new technologies to enhance the environmental sustainability in airports areas

MODERATOR

Léa Bodossian
Consultant

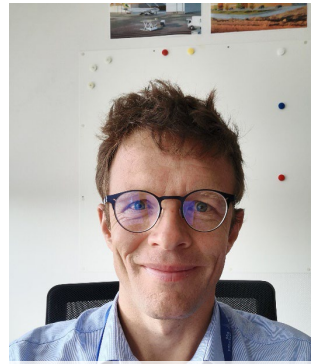
SPEAKERS

Jeanet van Antwerpen
Schiphol Area

Hannah S. Palmer
Finding the Flint project

Naashom Marx
Cincinnati Airport

Hugues Potart
Groupe ADP



Stanislas LEGO
ADP Ingenierie

Schiphol Airport

Amsterdam, The Netherlands

Royal Schiphol Group facilitates optimal links with the rest of the world in order to contribute to prosperity and wellbeing in the Netherlands and elsewhere.

It is Royal Schiphol Group’s ambition to develop Schiphol into Europe’s Preferred Airport for travelers, airlines and logistics service providers

KEY FIGURES

Schiphol/ AMS The Netherlands

103 Years **71M** passengers ↑ **1.72M** tons airfreight ↓

2324 jobs **327** flight connexions **1.509M** turnover ↑

Schiphol Airport Area

67.000 jobs **2.787** ha

Main sectors :
Logistics, Data-connectivity, Pharma, e-commerce

500 companies

Sustainability, Connectivity, Community

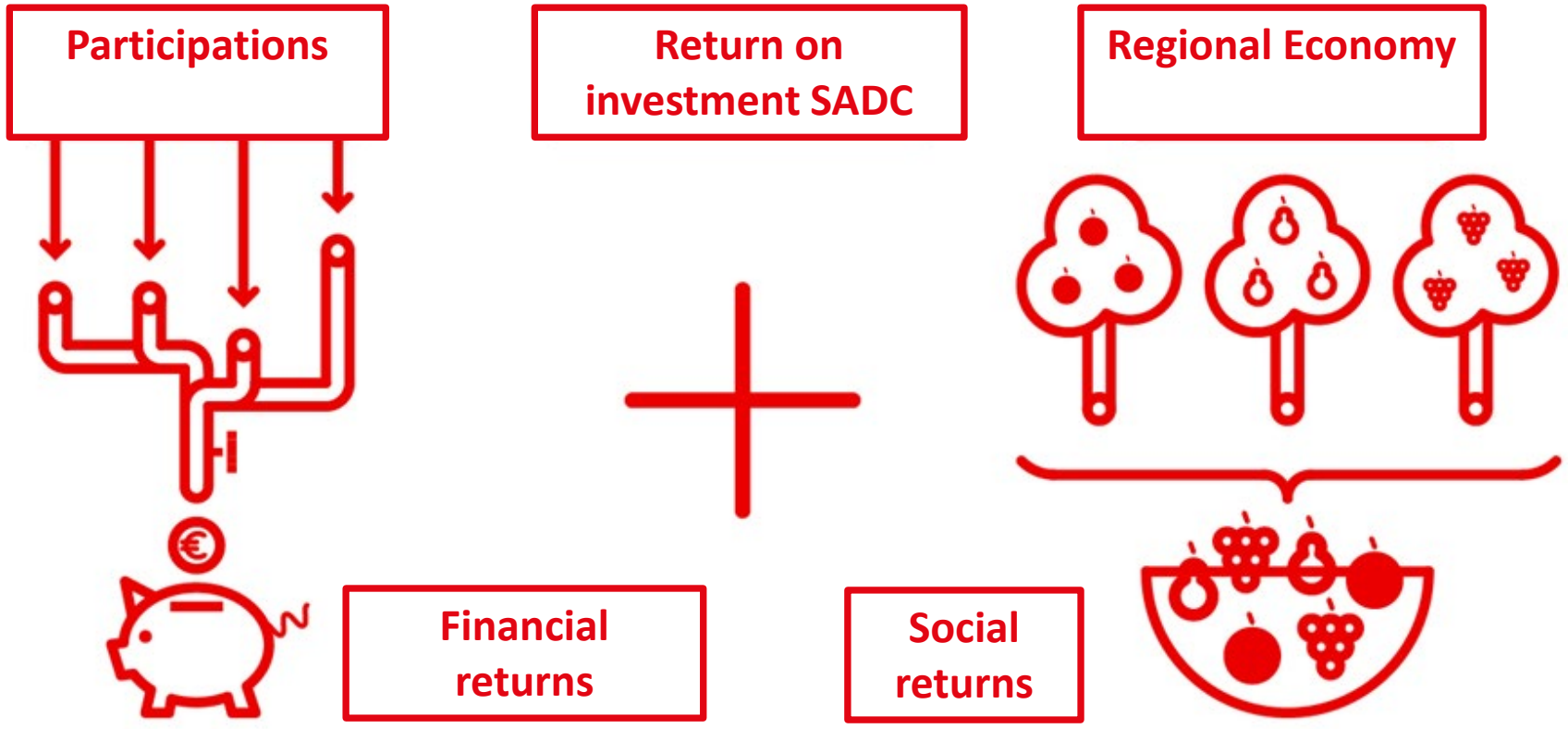
Schiphol Area Development Company

Using Big Data and new technologies to enhance the environmental sustainability in airport areas

Jeanet van Antwerpen, CEO
Atlanta
October 15 2019

Four equal shareholders

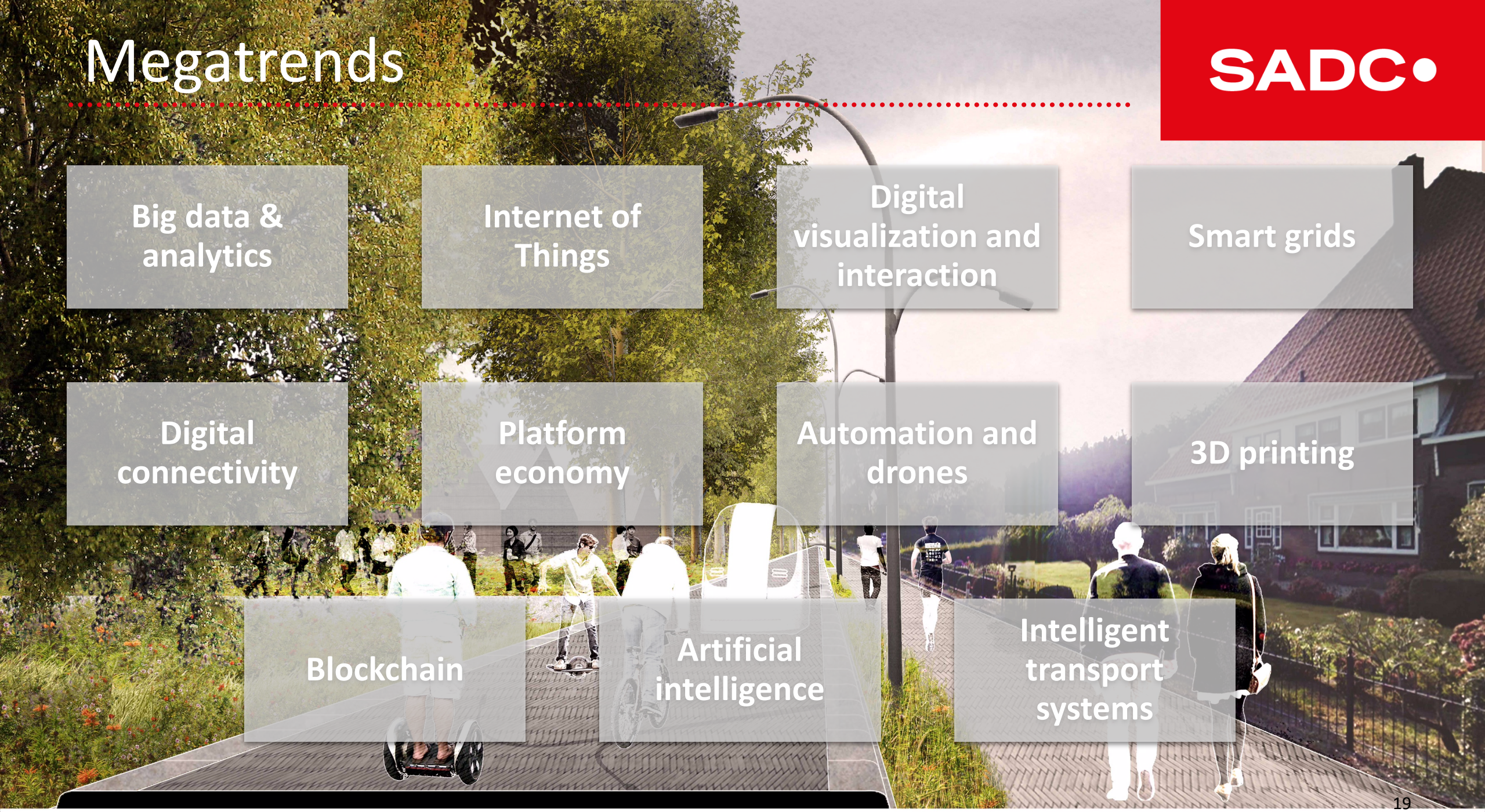
Our business model



Changing your mindset

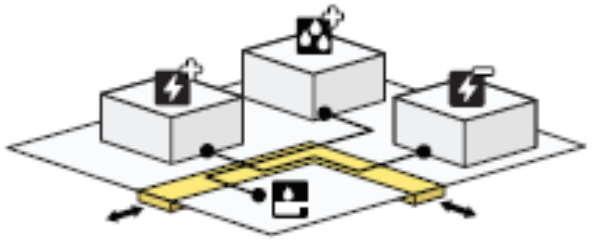
Team AreaTech

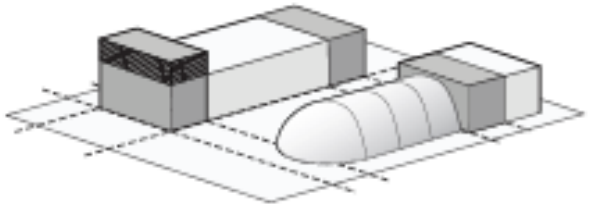
Megatrends

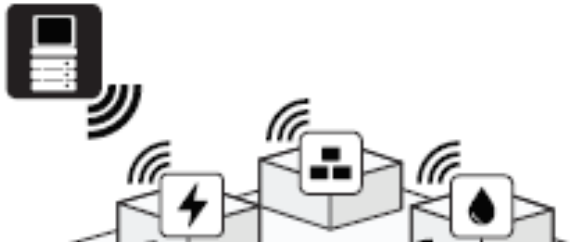

Big data & analytics
Internet of Things
Digital visualization and interaction
Smart grids
Digital connectivity
Platform economy
Automation and drones
3D printing
Blockchain
Artificial intelligence
Intelligent transport systems

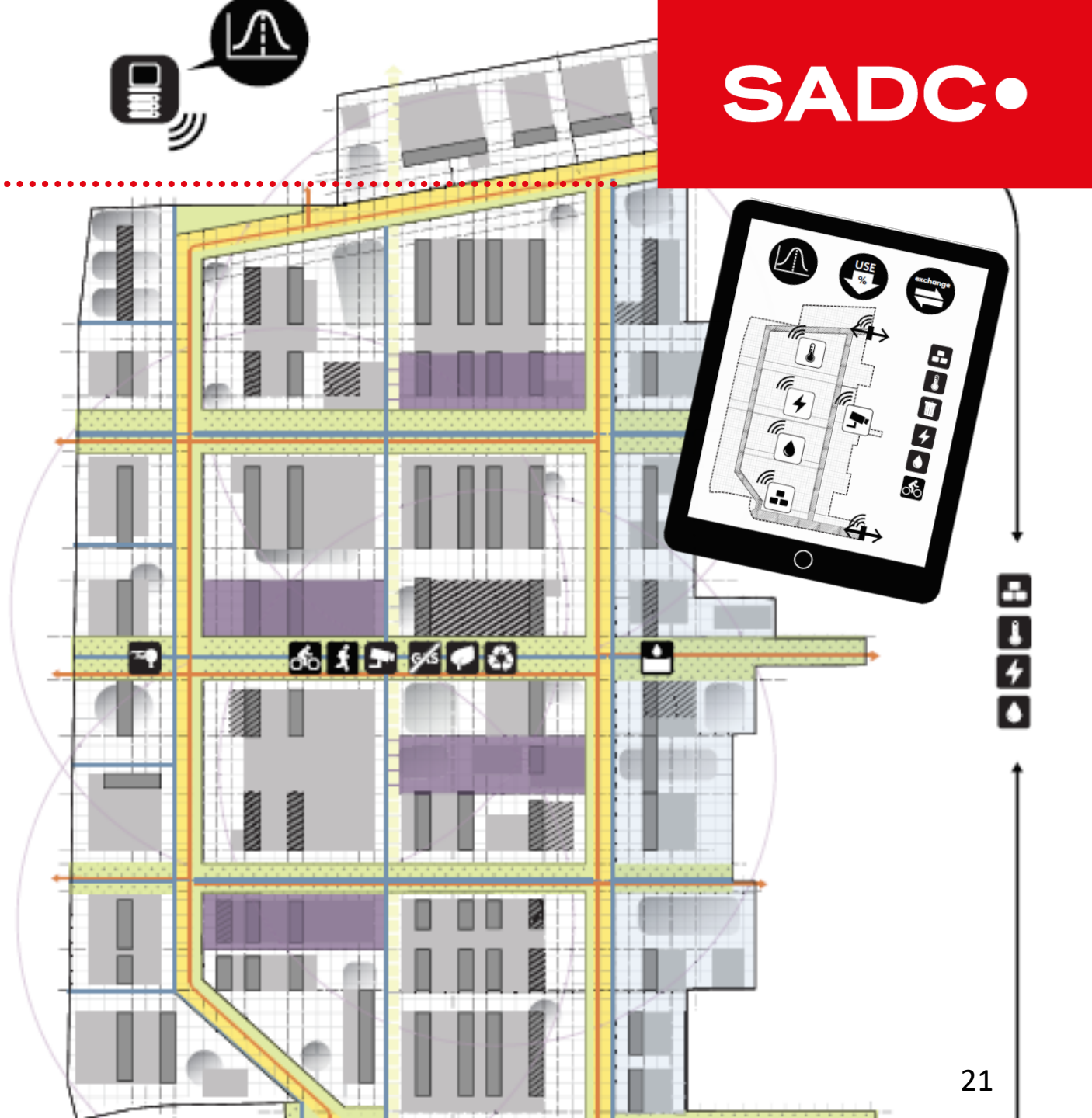
AreaTech into practice

Pilots – Smart Energy









Pilots – Smart Health

Smart logistics

SADC

Connected Transport Corridors

SAAIS 2019

THANK YOU

THE ROLE OF BIG DATA

PANEL 1

Using Big Data and new technologies to enhance the environmental sustainability in airports areas

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Léa Bodossian
Consultant

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Schiphol Area

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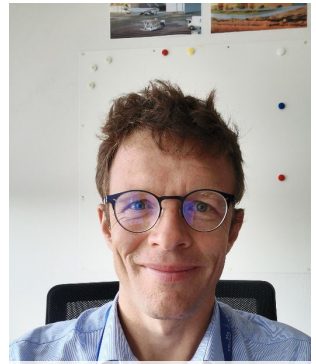
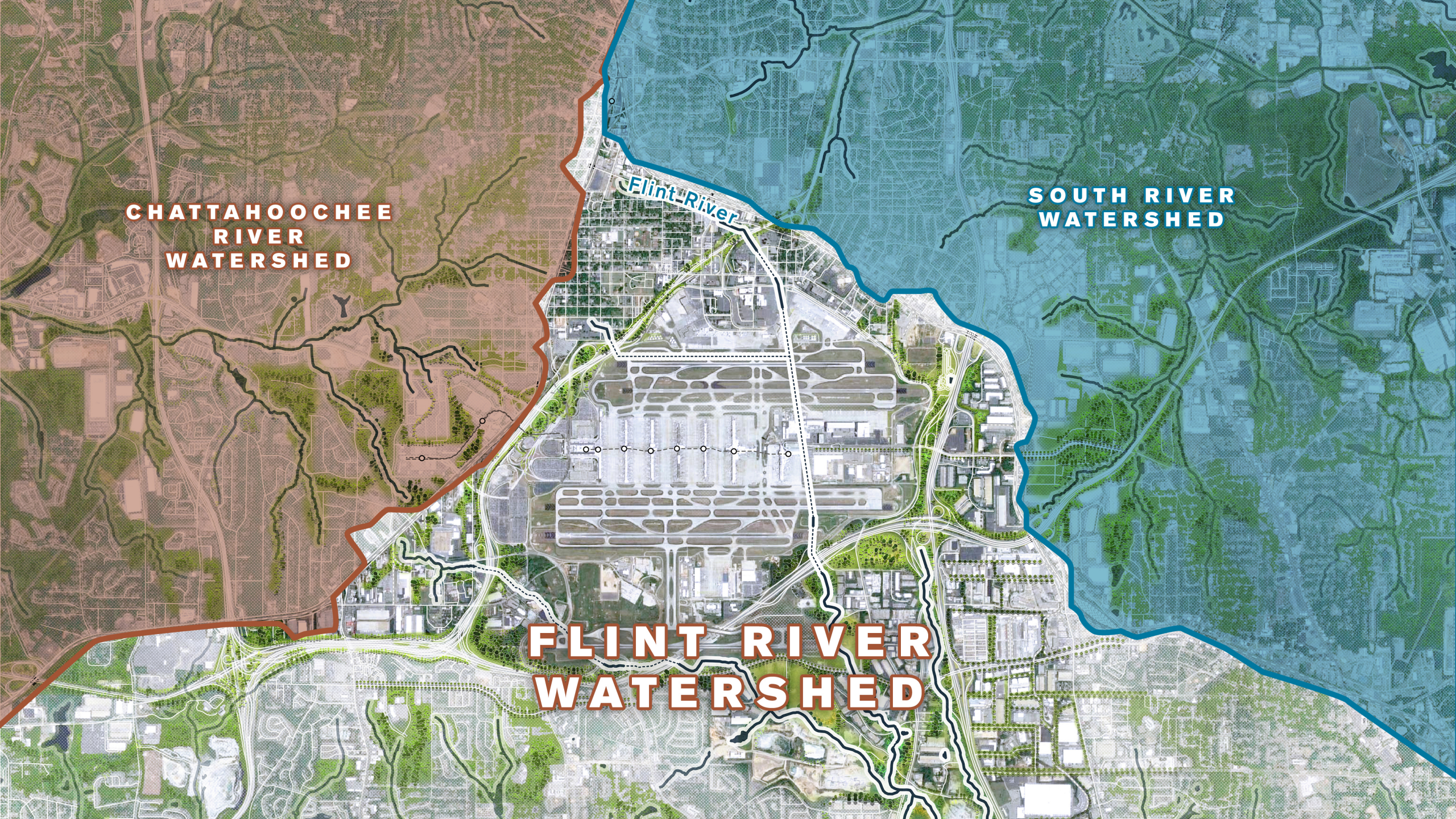


Stanislas LEGO
ADP Ingenierie


Finding the Flint
Putting a river
back on the map


CHATTAHOOCHEE
RIVER
WATERSHED
Flint River
SOUTH RIVER
WATERSHED
FLINT RIVER
WATERSHED


There’s a river down here…


It is one of the longest free-flowing
rivers in the nation.


HEADWATERS WALK
Urban Discovery


HEADWATERS WALK
Urban Discovery


STORMWATER PARK
Green Gathering Space
DELTA AIR LI


STORMWATER PARK
Green Gathering Space
DELTA

Home ▾ Upper Flint River Land Conservation and Restoration Modify Map Hannah ▾

Details | Basemap | Share Print ▾ Directions Measure Bookmarks Find address or place

About Content Legend

Contents

- [x] Counties
- [x] Upper Flint River Watershed
- [x] Flint River (main channel)
- [x] Conservation Easements
- [x] Protected Areas (PADUS CBIv2)
- [ ] Lakes & Reservoirs (A. Ignatius)
- [ ] Watershed Condition (10% + impervious)
- [x] Potential Restoration Parcels
- [x] Potential Conservation Parcels
- [x] Core Forest
- [x] Core Aquatic
- [x] Core Wetlands
- [ ] Stormwater Infiltration (BMPs)
- [x] Wetland Restoration
- [ ] Community

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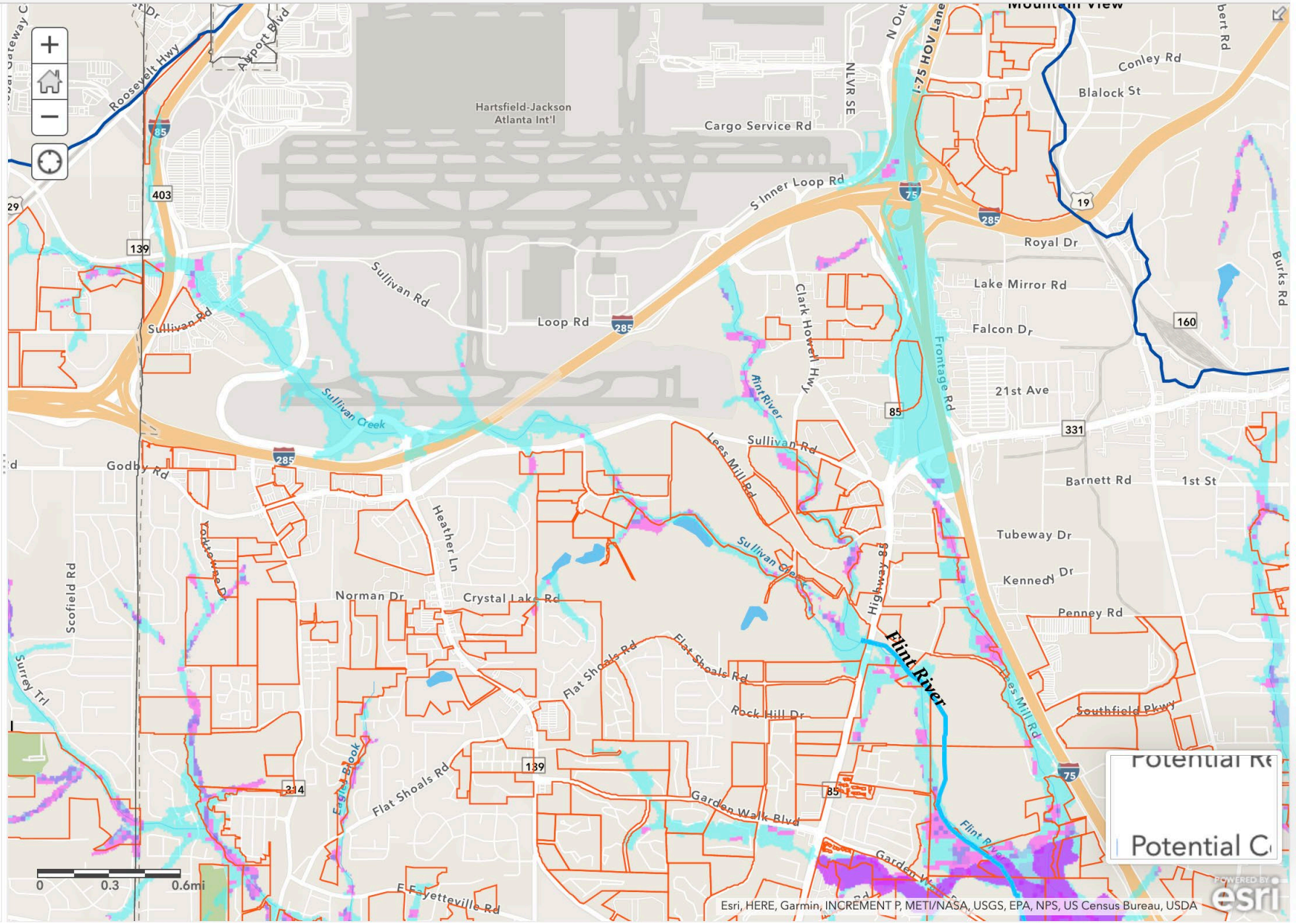


9TH ANN

RIVER MILE 346.3

Headwaters Nature Preserve

RIVER MILE 344.5

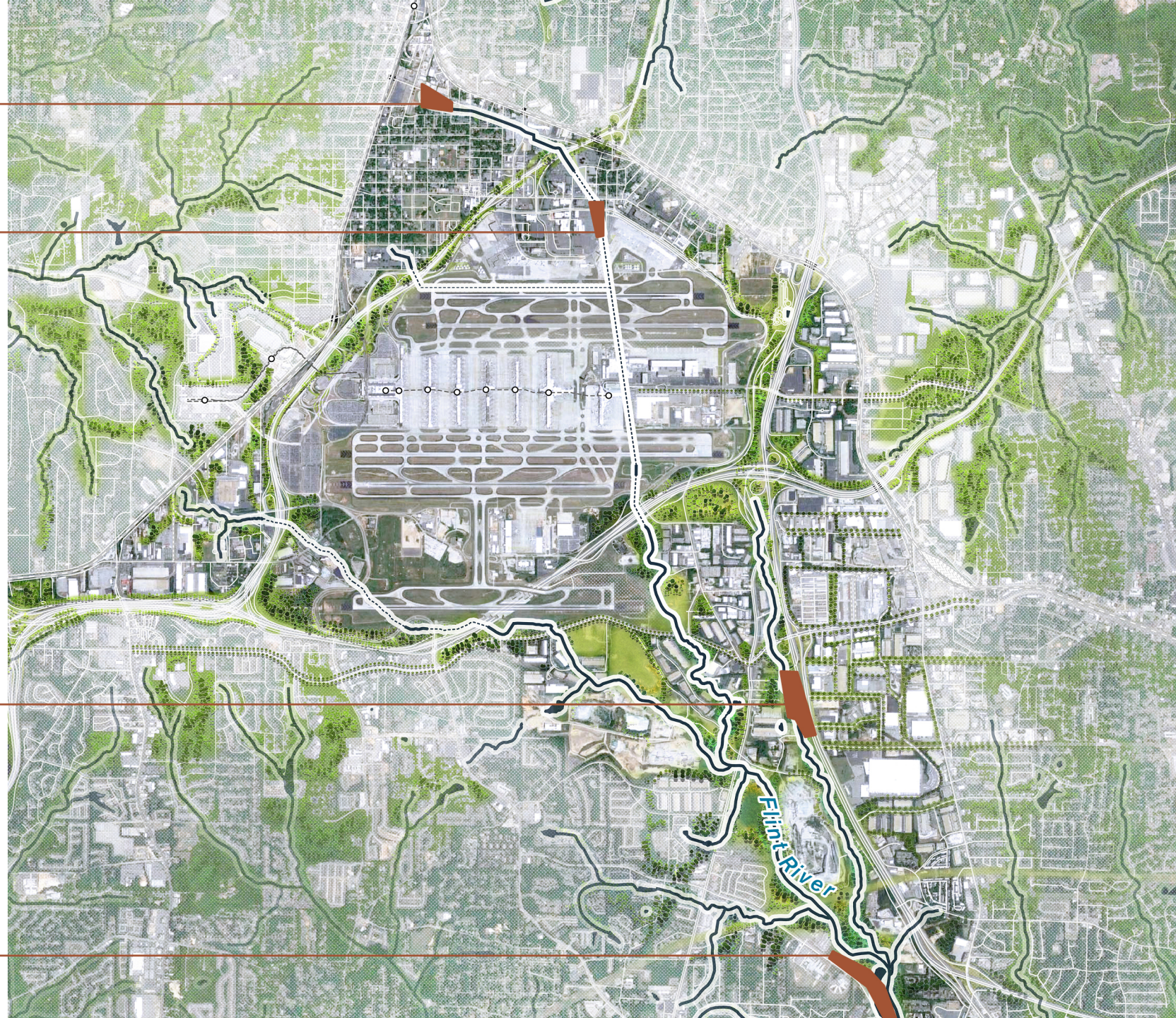
Restoration Park

RIVER MILE 341

Mud Creek Trailhead

RIVER MILE 338.5

Flint River Trail



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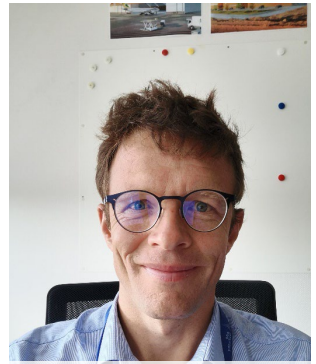

Stanislas LEGO
ADP Ingenierie

Cincinnati / Northern Kentucky International Airport (CVG)

Naashom Marx

Senior Manager of Strategic Innovation

@NaashomMarx

Cincinnati / Northern Kentucky International Airport (CVG)

8.9 million passengers (2018)

7th largest cargo airport in North America

14,000+ badged employees on campus

$4.4 billion economic impact to the region


Prime Air

FASTEST GROWING U.S. AIRPORT
3 years running
attributed to superior access to
air, road, river, and rail

5 completed sites
9 underway
3 in planning
$1.7+ billion and growing

GOAL

CLEAN WATER

WITH LESS ENERGY USE


N
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
© 2018 Google
US Dept of State Geographer
Google Earth
eye alt 6835.90 mi


Wyoming
South Dakota
Michigan
Wisconsin
Vermont
New York
New Hampshire
Massachusetts
Nebraska
Iowa
Connecticut
Utah
Colorado
Illinois
Indiana
Ohio
Pennsylvania
New Jersey
United States
Maryland
West Virginia
Missouri
Kentucky
Virginia
Arizona
New Mexico
Oklahoma
Arkansas
Tennessee
North Carolina
Bermuda
South Carolina
Texas
Mississippi
Alabama
Georgia
Louisiana
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
© 2018 Google
US Dept of State Geographer
Google Earth


Dearborn
CVG
Kenton
© 2018 Google
Google Earth
Imagery Date: 5/14/2017 39°02'54.28" N 84°28'34.88" W elev 622 ft eye alt 34.92 mi

Thank You!

Naashom Marx
@naashommarx
nmarx@cvgairport.com

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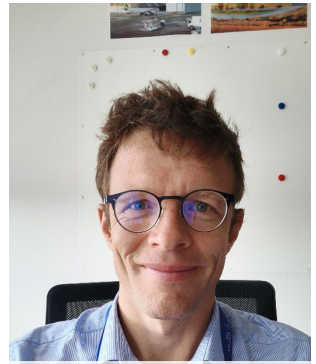

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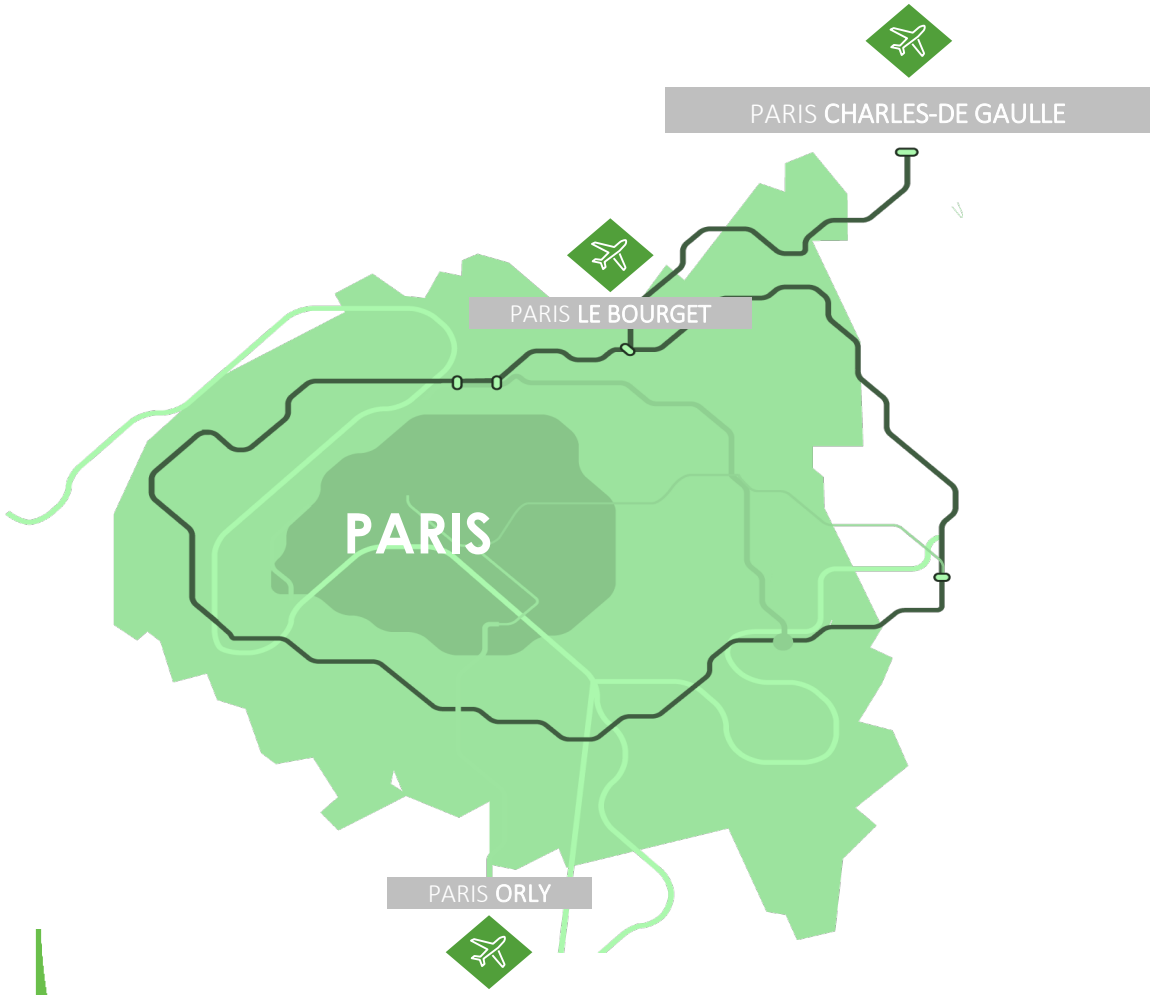
GROUPE ADP
SHARING NEW HORIZONS

USING BIG DATA AND NEW TECHNOLOGIES TO ENHANCE ENVIRONMENTAL SUSTAINABILITY

A FEW WORDS **ABOUT US**



TRAFFIC

PASSENGERS TRAFFIC
PARIS AÉROPORT 2018

105.3M
PASSENGERS
+3.8%

CDG
72.2M
PASSENGERS
+4%

ORY
33.1M
PASSENGERS
+3.4%

LBG
N°1
IN EUROPE
FOR BUSINESS AVIATION MOVMENTS

CDG + ORY
2.6 M
TONS OF CARGO

IMPACTS & CLUSTERS

> SHARED VALUE CREATION

CDG+ORY+LBG

122,000
DIRECT JOBS CREATED

> 2 COMPLEMENTARY AIRPORT PLACES(*)

PARIS AIRPORT AREA - **CDG**
- Hub of International Exchange
- Digital & Creative Industries

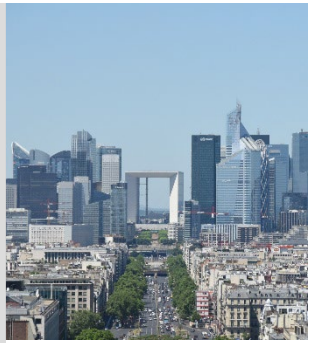
PARIS AIRPORT AREA - **ORY**
- Innovation & Research Hub
- Biotech Valley

(*) Source : Paris Region Entreprises > investparisregion.eu

PARIS REGION ENTREPRISES

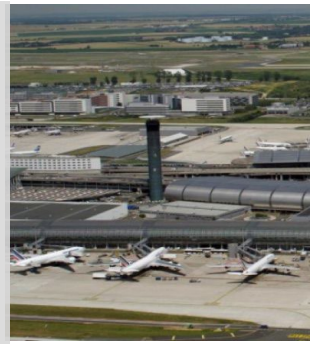
OUR 3 PROPPELLING FACTORS

STRATEGIC CENTER FOR **BUSINESS**



AMONG THE WORLD'S FAVORITE **TOURIST DESTINATIONS**

SUPER CONNECTED **HUB TO EUROPE & BEYOND**



Source : CHOOSE PARIS REGION

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILTY ?

1 2

USE BIG DATA – WHAT'S FOR ?

1

OPTIMIZE
CONSUMPTION & RESOURCES
THROUGH PREDICTIVE ANALYTICS

2

WE ARE THINKING
ABOUT IT

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

1 OPTIMIZE CONSUMPTION & RESOURCES THROUGH PREDICTIVE ANALYTICS

Example # 1 1/3

> IMPROVE AIRPORT OPERATIONS AND THEREFORE CO2 EMISSIONS

SAFETY LINE
Big Data applied to Aviation

AIRPORTS NEEDS TO OPTIMIZE THEIR OPERATIONS, SAFETY AND ENVIRONMENTAL IMPACTS

AIRLINES NEED TO OPTIMIZE OPERATIONAL PERFORMANCE IN ORDER TO REDUCE JETFUEL CONSUMPTION AND THEIR ENVIRONMENTAL FOOTPRINT

BIG DATA

1a AIRSIDE WATCH Improve Airport Operations

1b OPTI FLIGHT In-flight guidance

KEY POINTS

IN ORDER TO ACHIEVE ITS GOALS, GROUPE ADP DECIDED TO BECOME A SHAREHOLDER OF SAFETY LINE, A START UP OF THE FUTURE, TO

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

1 OPTIMIZE CONSUMPTION & RESOURCES THROUGH PREDICTIVE ANALYTICS

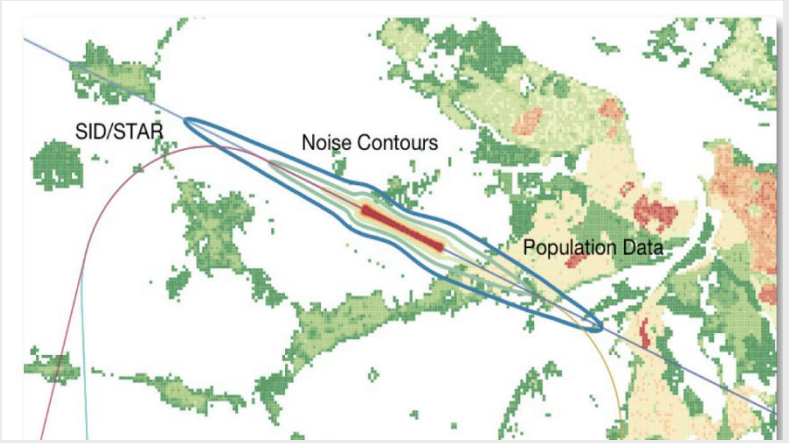
Example # 1 2/3

> IMPROVE AIRPORT OPERATIONS AND THEREFORE CO2 EMISSIONS

1a

AIRSIDE WATCH
Improve Airport Operations

AIRCRAFT SURFACE MOVEMENT RADAR DATA + BIG DATA SOLUTIONS



KEY POINTS

- Use of ground radar data which are only used by ATC
- Provide detailed analytics and allow, through modelling, a bettter knowledge and understanding of airport's operations and its impacts notably on environment.

Optimization of flows, taxiing time and trajectories will reduce significantly CO2 emissions and noise

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

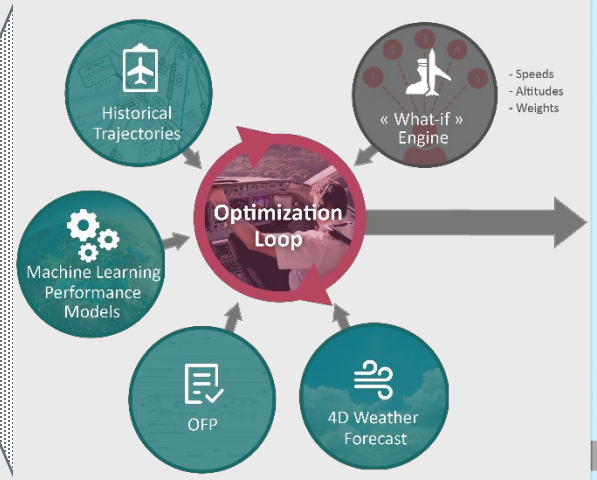
1 OPTIMIZE CONSUMPTION & RESOURCES THROUGH PREDICTIVE ANALYTICS

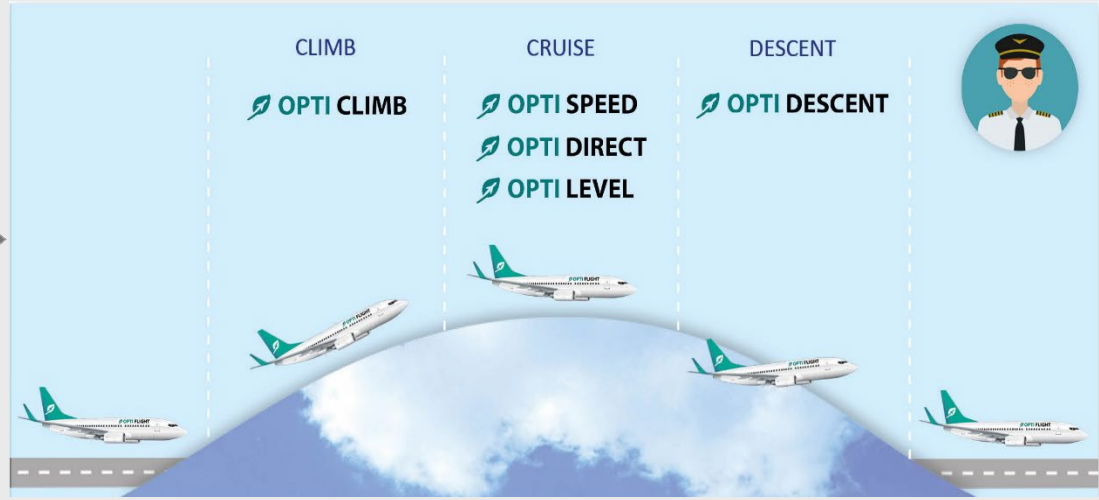
Example # 1 3/3

> IMPROVE AIRPORT OPERATIONS AND THEREFORE CO2 EMISSIONS

1b

OPTI FLIGHT
In-flight guidance





KEY POINTS

- Reduce both fuel consumption and CO2 emissions
- Use flight data to build machine learning performance models for each tail number
- Optimize all flight phases by proposing customized recommendations to pilots

- **Up to 6% reduction** of climb fuel **> less CO2 emissions**
- **Important savings for airlines** *(N.B : jetfuel reprensents nearly 25-30% of costs for airlines)*

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

1

OPTIMIZE CONSUMPTION & RESOURCES THROUGH PREDICTIVE ANALYTICS

Example # 2 1/3

> IMPROVE AIRPORT OPERATIONS AND THEREFORE CO2 EMISSIONS

TERMINAL 4

- New Terminal 4 at Paris-Charles de Gaulle airport
- Available space for a 35/40 Mpax new terminal
- Should accomadate traffic growth till 2035 - 2040

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

1

OPTIMIZE CONSUMPTION & RESOURCES THROUGH PREDICTIVE ANALYTICS

Example # 2 2/3

> IMPROVE AIRPORT OPERATIONS AND THEREFORE CO2 EMISSIONS

TERMINAL 4

MASTER PLANS HISTORY

Initially 27 scenarios, all of them meeting the same requirements in terms of overall square meters

How to choose the best terminal design option to optimize airport operations, terminal capacity, costs **while taking into account environmental impacts ?**

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

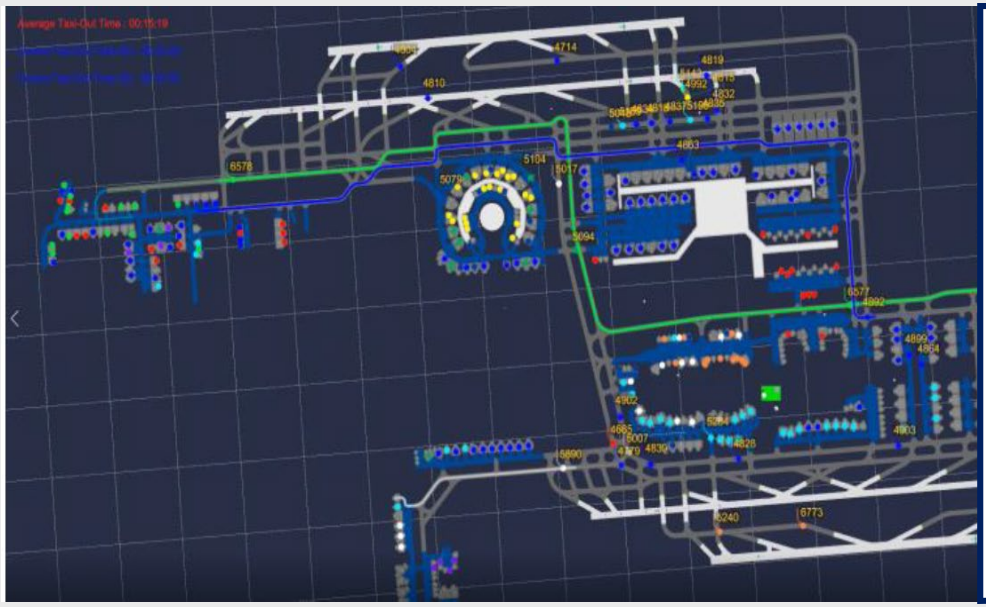
1

OPTIMIZE CONSUMPTION & RESOURCES THROUGH PREDICTIVE ANALYTICS

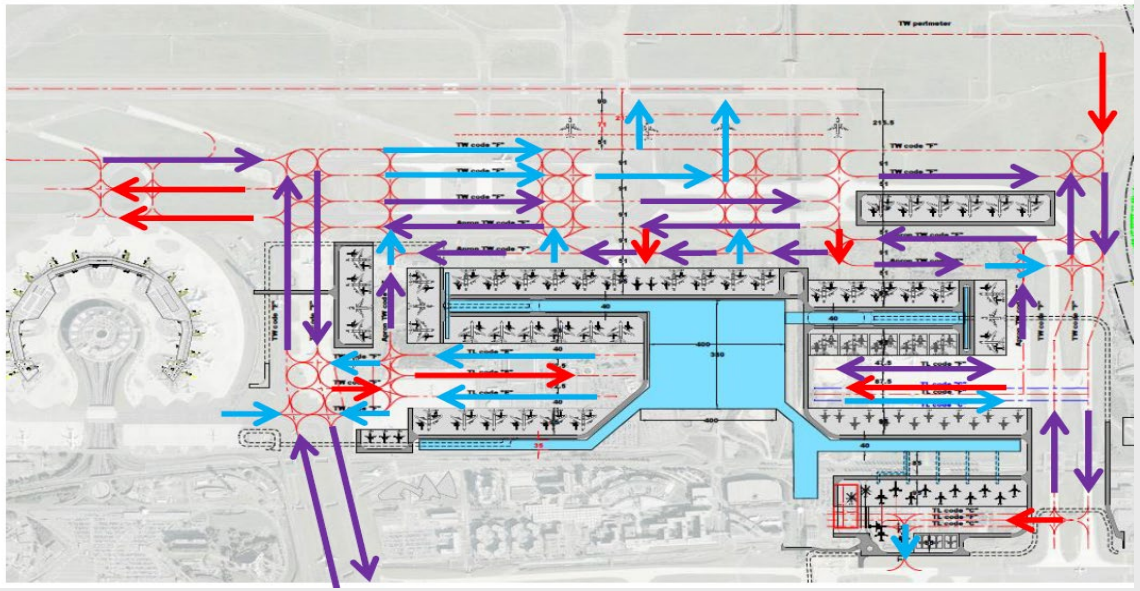
Example # 2 3/3

> IMPROVE AIRPORT OPERATIONS AND THEREFORE CO2 EMISSIONS

TERMINAL 4



USE OF BIG DATA TO PROVIDE MODELLING ASSUMPTIONS BASED ON GROUND TRAFFIC FLOWS



KEY POINTS

- Modelling assumptions to identify best scenario of terminal design taking into account stand allocation/ taxiing speed/ optimization of runway threshold

Optimization of terminal operations will inevitably impact emissions of CO2 and noise

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

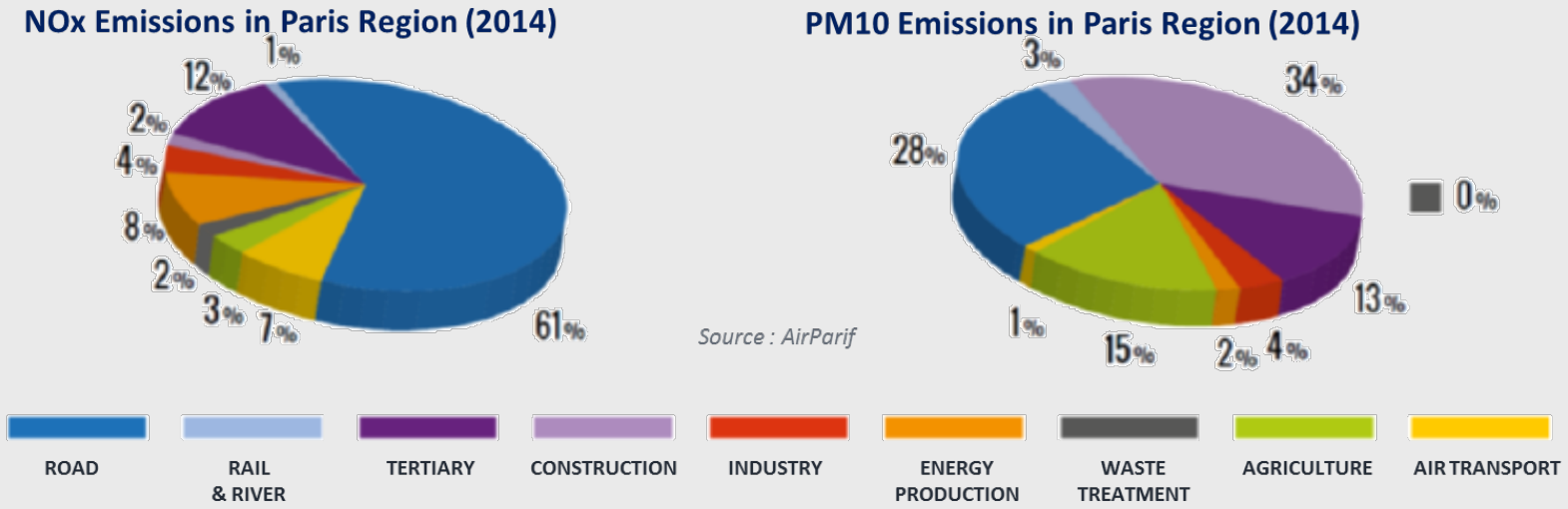
2 WHAT WE ARE THINKING ABOUT

MOBILITY

Example # 1

1/2

CURRENT SITUATION OVERVIEW IN PARIS REGION



- Only nearly 10% of Paris Region's inhabitants use shared-mobility options
- In 2016, significant growth of average travel time in Paris-Region mostly due to traffic congetsion
- **In 2012, 32% of greenhouse gaz were due to road transport**
- **In 2017, in our airports, 29% of gaz emissions were due to road access by employees and passagers**

KEY POINTS

To reduce its environmental impact, Groupe ADP relies on a wide range of sustainable mobility solutions for both its employees and its customers (pax).

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

2 WHAT WE ARE THINKING ABOUT

MOBILITY

Example # 1

2/2

CURRENT SITUATION IN OUR AIRPORTS

2 OPTIONS ARE BEING CONSIDERED

CAR POOLING

> **For employees :** potential of nearly 90k in CDG and 29 k in Orly

> **For passengers and waiting people**

Use of dedicated digital platforms are under consideration for employees, pax and mix employees/pax

CAR SHARING

Legal aspects under review

KEY POINTS

These new technologies should contribute to reduce both congestion on roads and environmental impacts.

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

2 WHAT WE ARE THINKING ABOUT

Example # 2

USING ARTIFICIAL INTELLIGENCE TO IMPROVE AND CONTROL

1/2

CURRENT SITUATION IN OUR AIRPORTS

- CDG and Orly have a huge coverage of their airside with cameras
- These cameras are mainly used to monitor operations on parking stands, taxiways and jetways.
- They complete sights and timers to improve efficiency of aircraft turn arounds and operations.

KEY POINTS

Need to connect this cameras to A.I for a better use

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

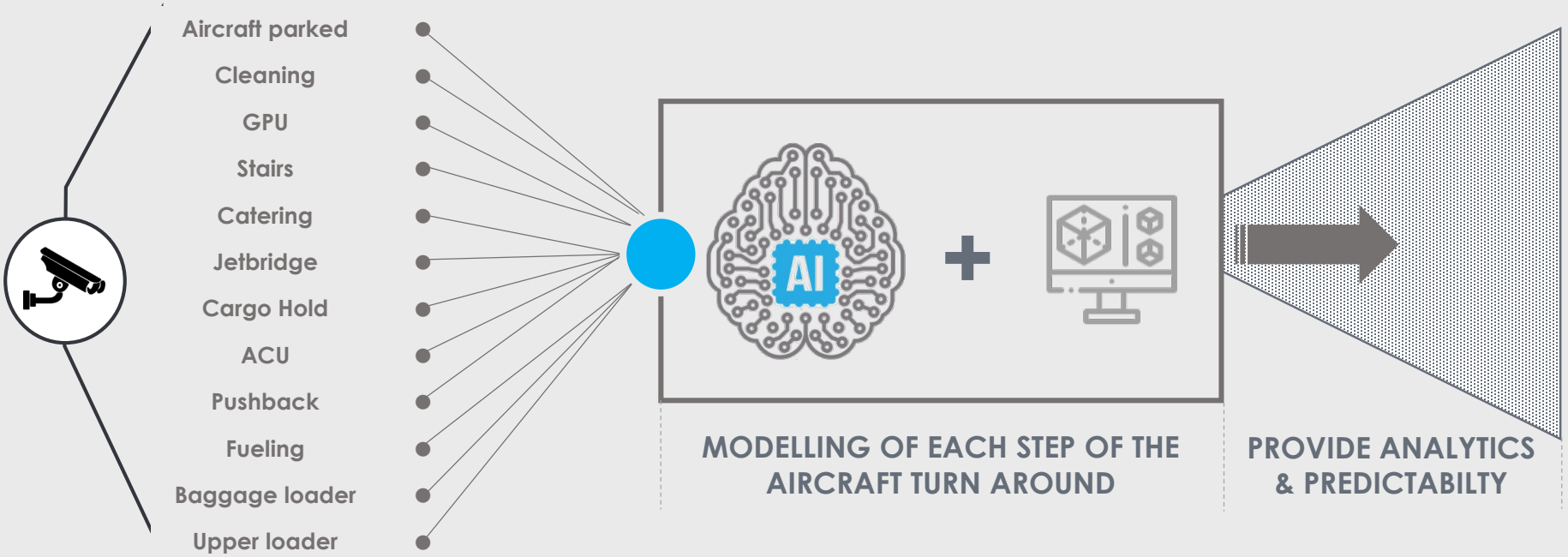
2 WHAT WE ARE THINKING ABOUT

USING ARTIFICIAL INTELLIGENCE TO IMPROVE AND CONTROL

Example # 2

2/2

CURRENT SITUATION IN OUR AIRPORTS



- Automating of each step of the a/c turn around
- Improve safety
- Improve on-time performance
- **Improve operations and therefore emissions**
- **Monitor use of 400 Hz, etc.**

KEY POINTS

Modelling and connect cameras to A.I could expand the range of possibilities but means to make data reliable first

HOW WE USE BIG DATA IN PARIS TO ENHANCE SUSTAINABILITY ?

2 WHAT WE ARE THINKING ABOUT

OTHER IDEAS …

WATER — Modelling, predicting and optimizing water consumption

WASTE — Modelling, predicting and optimizing waste management

BIODIVERSITY — Modelling, predicticing and protecting wildlife

SAAIS 2019

THANK YOU

THE ROLE OF BIG DATA

PANEL 1

Using Big Data and new technologies to enhance the environmental sustainability in airports areas

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Schiphol Area

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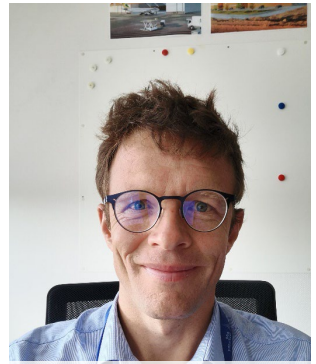
Hugues Potart
Groupe ADP



Stanislas LEGO
ADP Ingenierie

Using Data Science to Improve Sustainability and Efficiency of Energy Systems

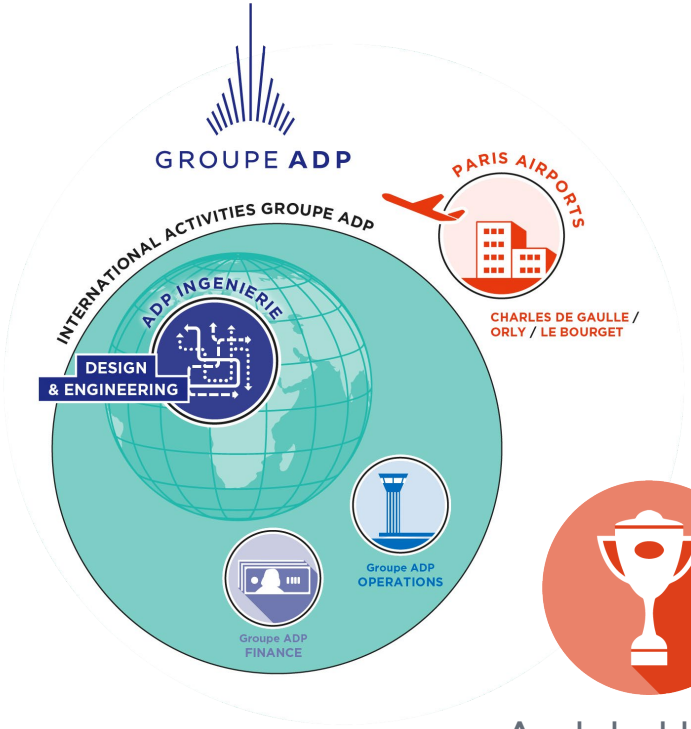
ADP INGÉNIERIE

Introduction

towards a smart and decarbonized energy system ...

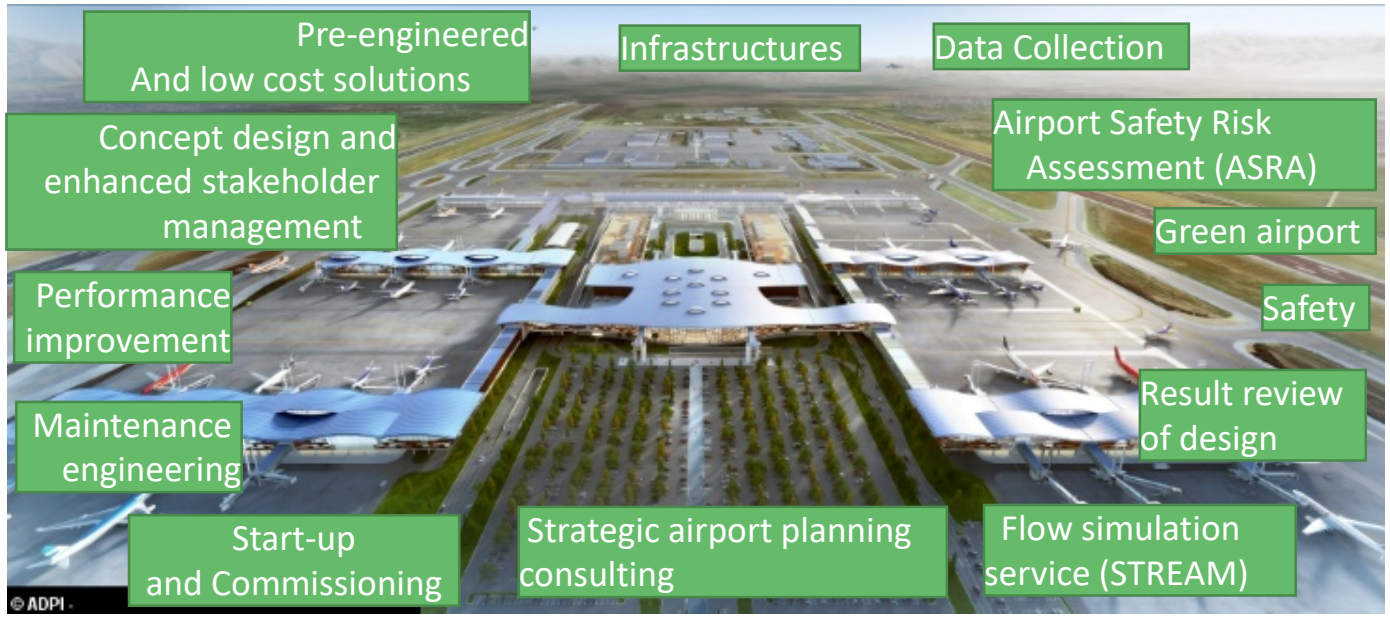
I. Planning	Energy Master Plan
II. Design / Construction	Passive Design Strategies
III. Operations	Smart/Micro Grid

Quick introduction to ADP Ingénierie …

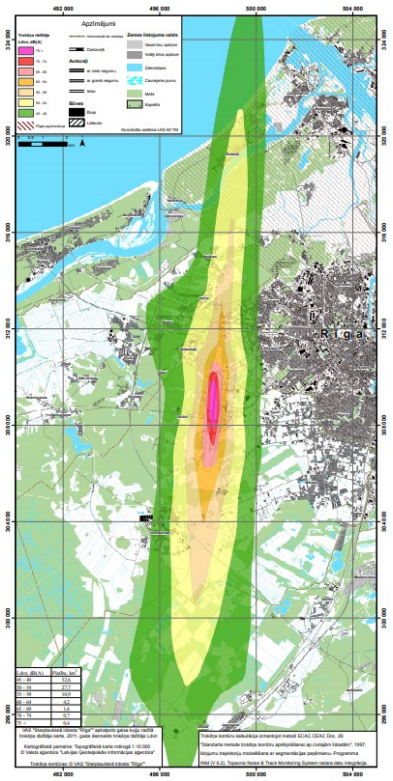


- A global leader in airport engineering
- 52 Millions euros in 2017
- 400 employees in 19 countries
- Certification ISO 9001 since 2003

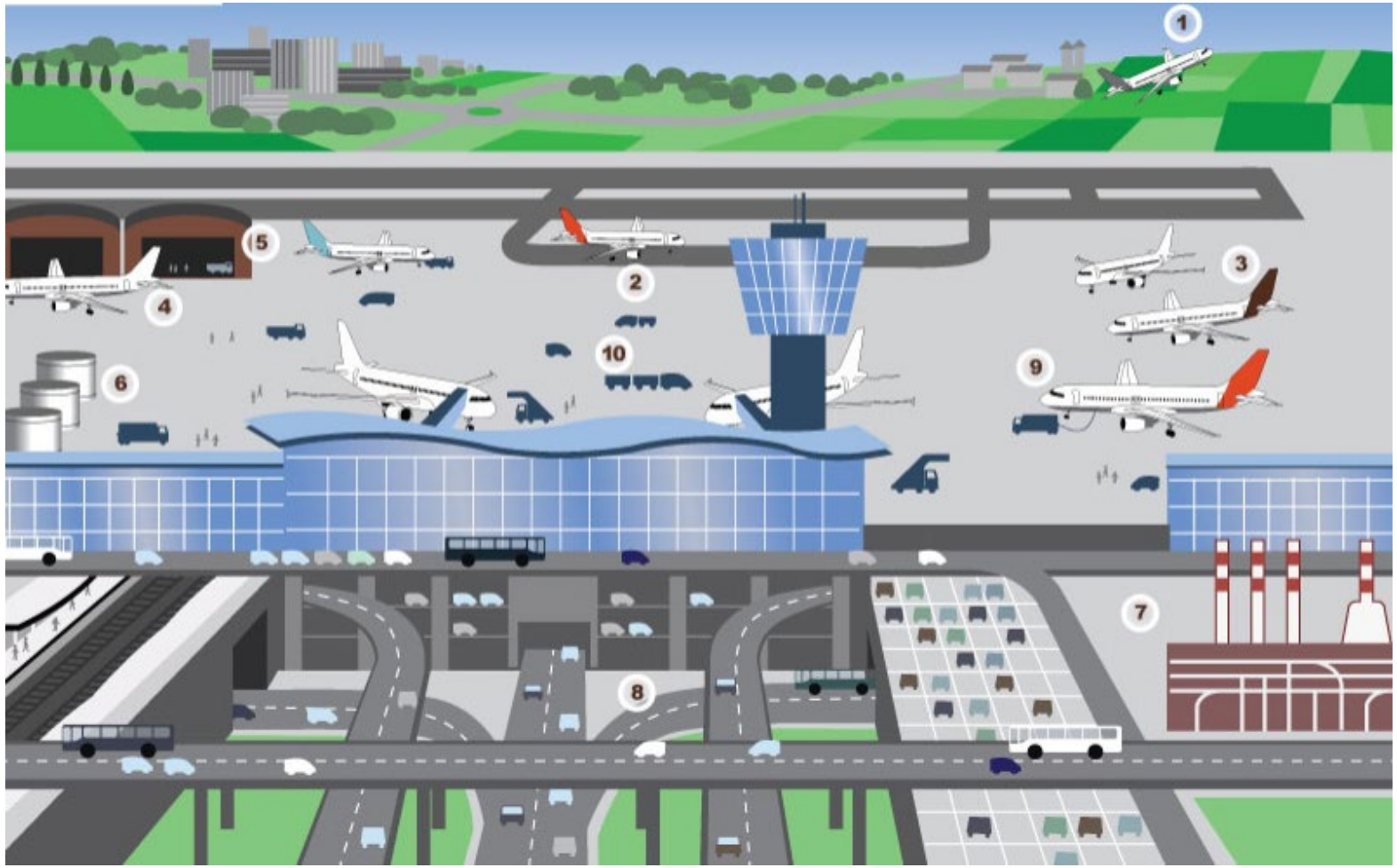
360 Airport Expert



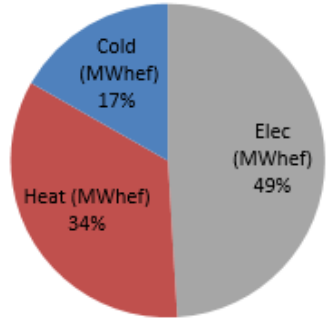
Context: Negative impacts of an Airport



Noise exposure map

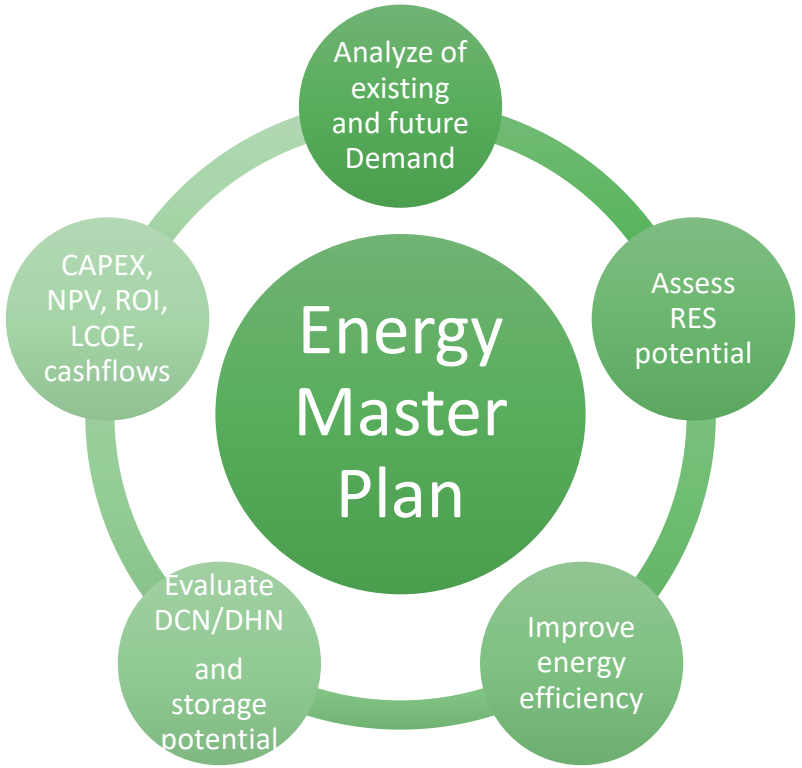


1 LTO
2 Taxiing
3 APU
4 Engine Trial
5 Maintenance
6 Fuel storage
7 Power Plant
8 Road trafic
9 GPU and ACU
10 Runway devices



Electric consumption: 30M pax/year airport
~ a town of 100,000 people.

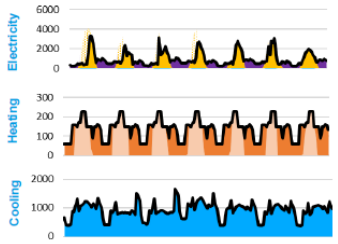
I. Planning: Energy Master Plan



Objectives

- Use of **data science** to review innovative energy production solutions
- Build scenarios based on
  - Multi-fluid energy including mobility
  - Multi-node modelling
- Technico-economic optimization
- Sensitivity analysis of evolution of key parameters

I. Planning: Energy Master Plan



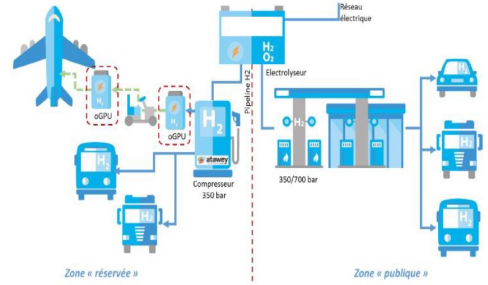
- Loads
- Equipments
- Grid connections
- Fuels
- Time horizons
- Metering
- Topology

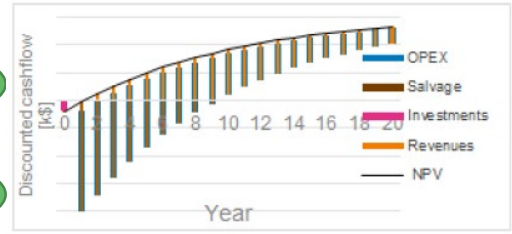
DATA COLLECTION

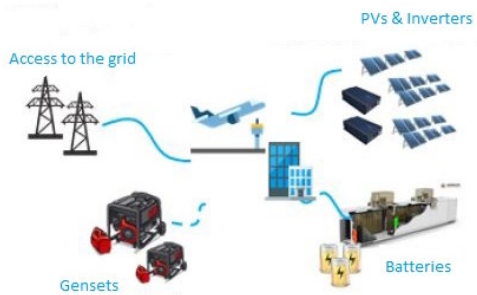
- Energy needs
- Technologies / Innovations
- Market / Regulatory / Subsidies
- Investment Strategy

LEAST COST OPTIMIZATION MODEL

- Energy efficiencies
- Best mix of supply options
- Sizing of assets
- Economic performance
- Savings
- RES Shares
- Avoided CO2 Emissions

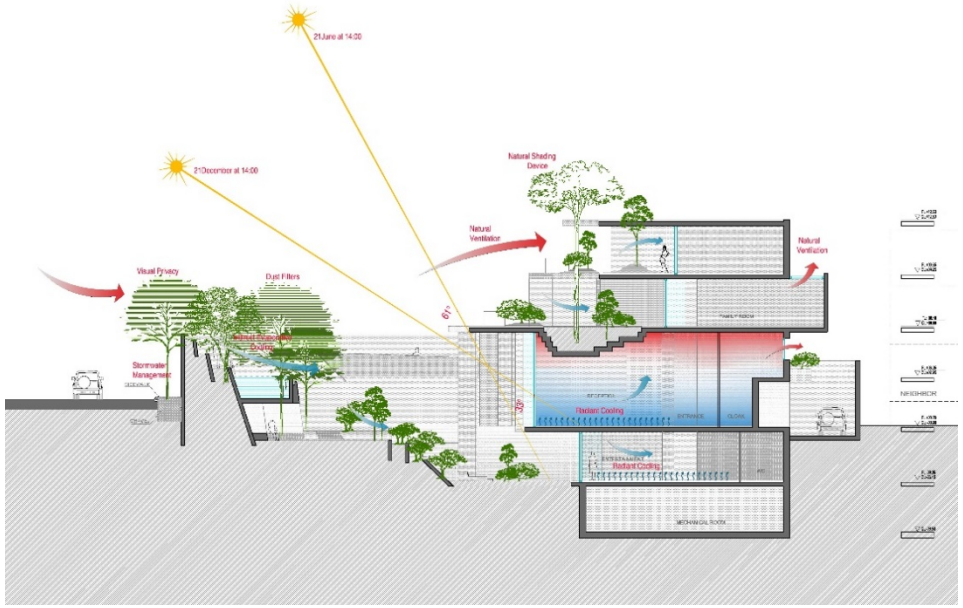


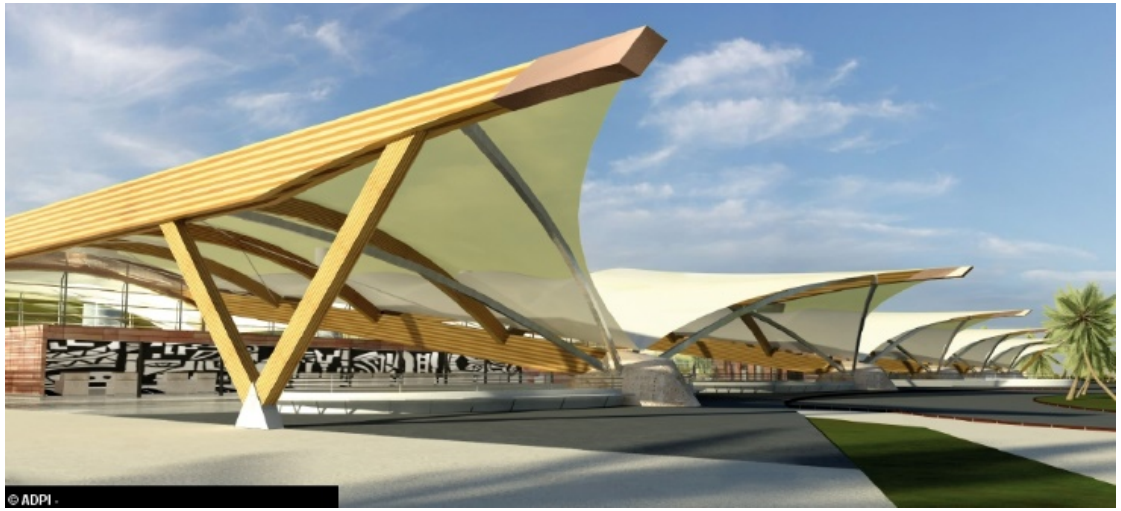




FINANCIAL AND ENVIRONMENTAL PERFORMANCE

II. Design: Passive Design Strategies





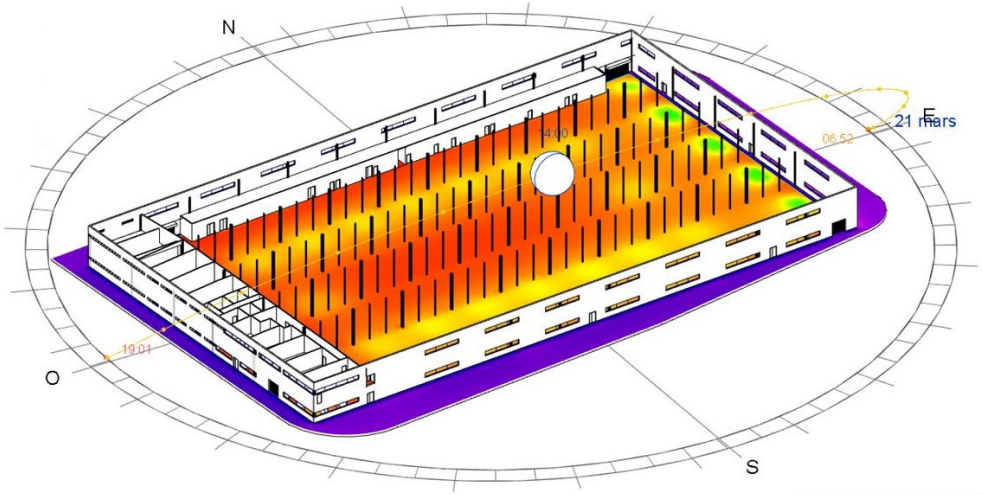
Take advantage of local climatic resources

Reduce heating requirements	Reduce cooling requirements
Optimize compactness	Optimize orientation and size of the windows
Efficient envelope insulation	Solar protections and shading
Manage thermal bridges	Manage heat loads from systems (lighting, elevators, IT rooms, BHS…)
Increase air tightness	Increase thermal inertia
Optimize orientation and size of the windows	Promote natural ventilation (free/night cooling)
Efficient glazing	Canadian wells

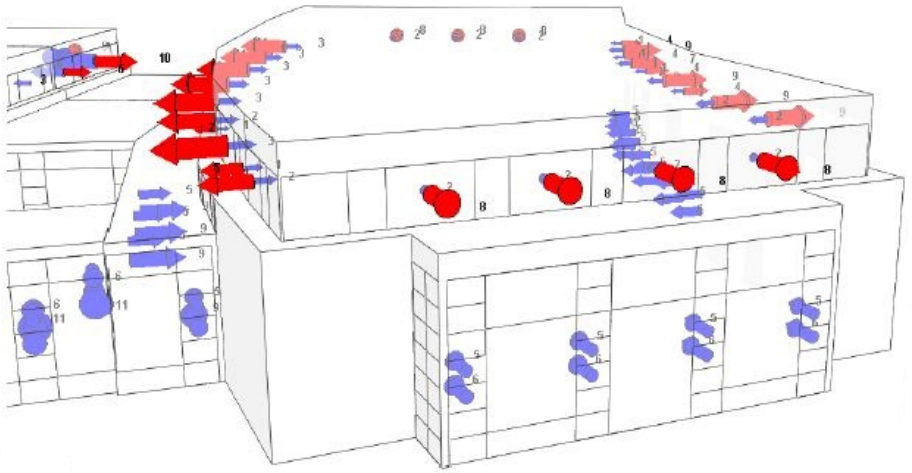
- **Thermal confort**
- **Well-being**
- **Energy savings**

II. Design: Passive Design Strategies

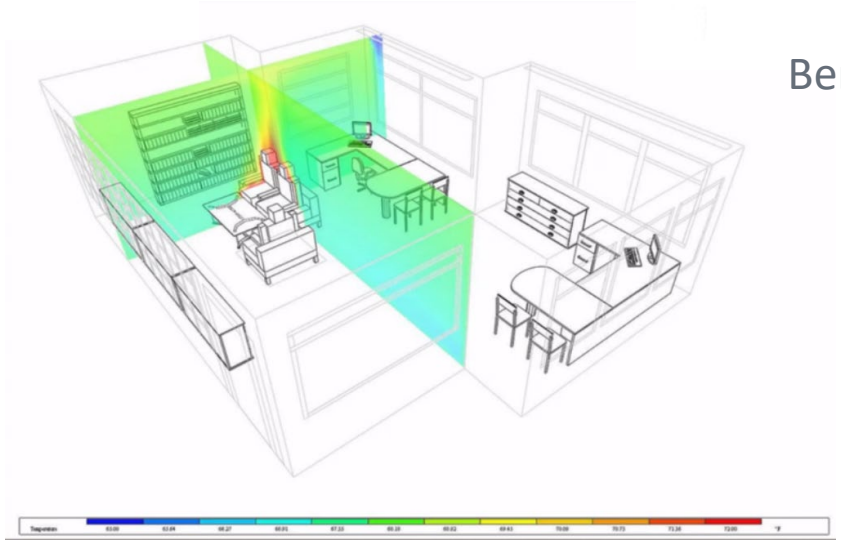
Dynamic Thermal Modelling allows to improve thermal performance of existing building



Daylighing analysis for a baggage handling facility at Paris-CDG



Benefits of Natural Ventilation

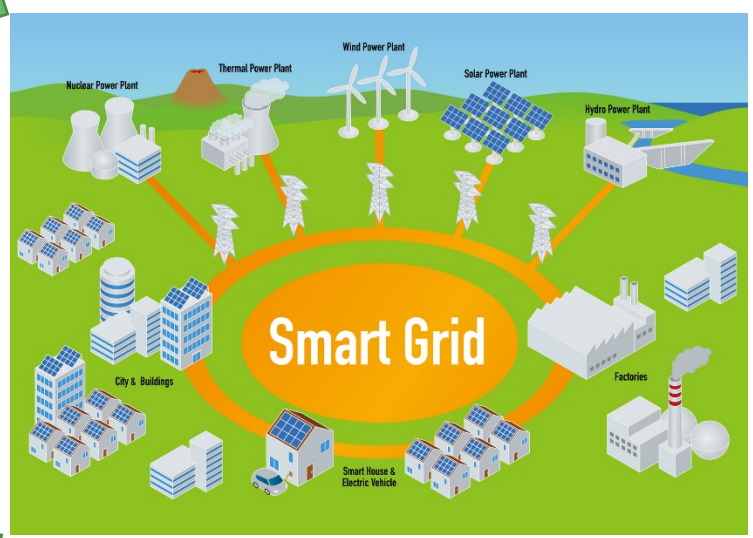


Thermal Confort using CFD

III. Operations: Smart /Micro Grid

Measure accurately the demand

Decentralised Production/ Storage



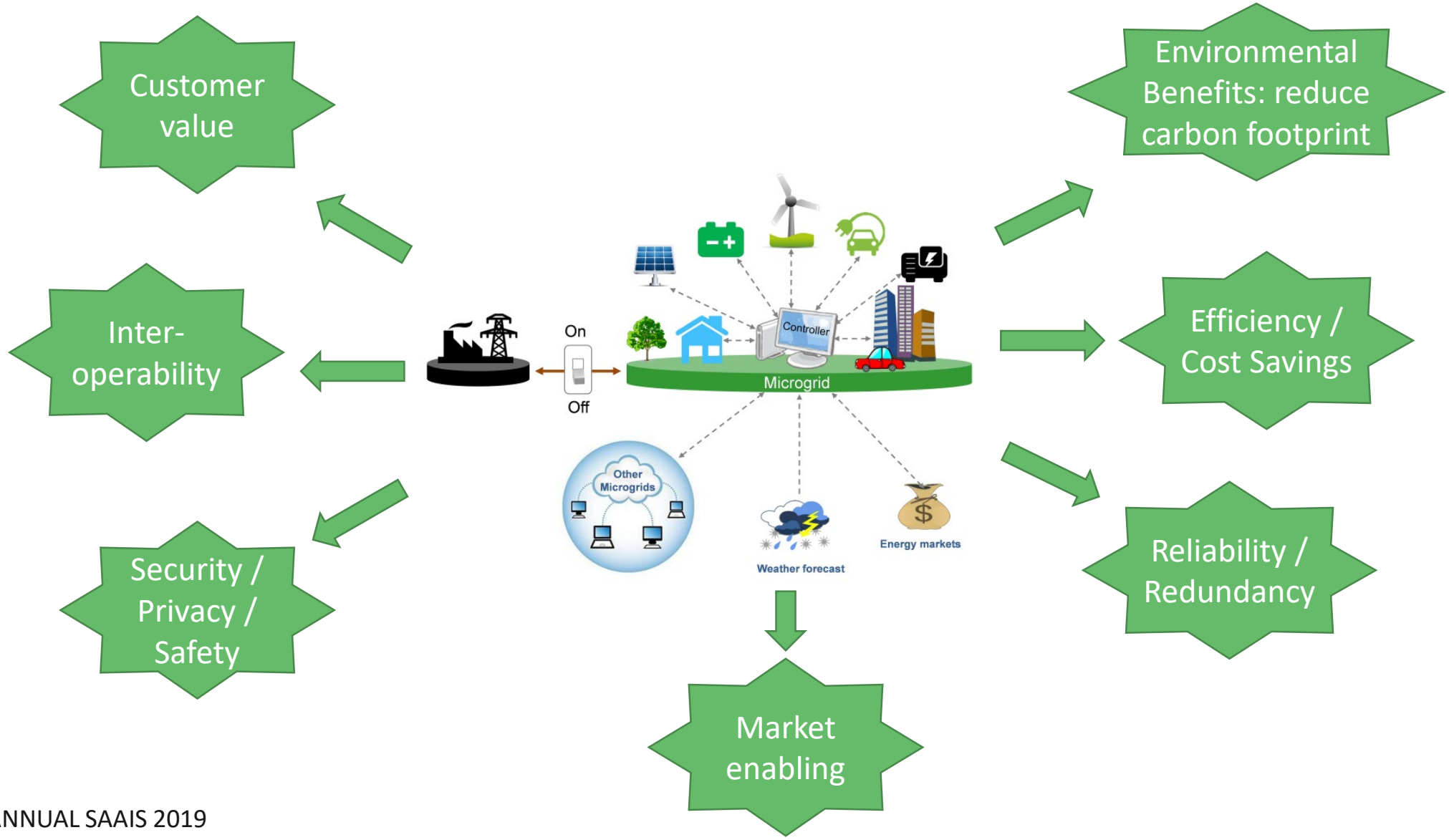
Load balancing

Numerical solver

Reliability

Communicating network

III. Operations: Smart /Micro Grid



Why a smart and decarbonized energy system?

Technical and Financial Benefits

I. Planning - Energy master plan:

- Tailor the production
- Share capacities
- Take benefit of innovations

II. Design - Passive Design Strategies

- Bioclimatic buildings
- Quick payback

III. Operations – Smart/Micro grid:

- Balance production and loads
- Energy storage
- Redundancy / Reliability
- Optimize energy cost
- Operations flexibility

Environmental Benefits

- Reduce direct carbon emissions and mitigate impacts on environment
- Improved infrastructure resilience
- Increase comfort for customers and employees
- Enhance acceptability for communities.
- Improve renewables shares in energy mix.
- Contribute to the airport sustainability

SAAIS 2019

THANK YOU

THE ROLE OF BIG DATA

PANEL 1

Using Big Data and new technologies to enhance the environmental sustainability in airports areas

MODERATOR

Léa Bodossian
Consultant

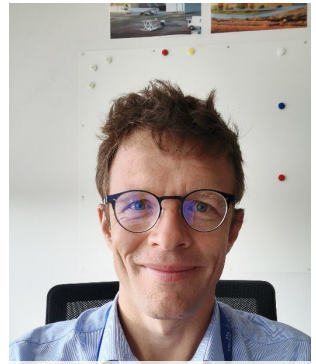
SPEAKERS

Jeanet van Antwerpen
Schiphol Area

Hannah S. Palmer
Finding the Flint project

Naashom Marx
Cincinnati Airport

Hugues Potart
Groupe ADP



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NETWORKING COFFEE BREAK

Meet the Start-ups

15 min

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