
GILYTICS
GILYTICS
Revolutionizing infrastructure planning
esa
business incubation centre
Switzerland
ETH zürich
European Commission
Horizon 2020
European Union funding
for Research & Innovation

Gilytics Mission & Vision

Gilytics helps society to build a more sustainable and transparent energy and transportation infrastructure network

What We Do?

Infrastructure Planning and Design Challenges

- Management and leverage of Geodata
- Slow Manual Routing & Design
- Not familiar with GIS or No access to GIS Desktop solutions
- Difficult Quantitative Comparison of Alternatives
- Project Visualization not always able to convey the message
- Slow and untransparent Stakeholder Communication

GILYTICS

Gilytics provides a **Decision Support System** as GIS **cloud solution** to **automate and optimize energy infrastructure planning and design** *by saving time and improving transparency by leveraging* ***spatial data:***

Pathfinder

- **Multi-users**
- **Decision Support System for optimal routing and planning of overhead and underground powerline**
- **Identifies routes by optimizing parameters such costs, impact on the public and the environment**
- **Onshore, offshore, grid connection of renewables**
- **Substation and new renewable energy plants siting suitability studies**

Planning Optimization

OH and Underground Cable Routing

Stakeholder engagement with AR on mobile devices

Solar & Wind Siting & Grid Connection

Environmental Feasibility Process

Hybrid Planning OH & Underground & Tunneling combined

Investment Feasibility Study

How We Do It?

Pathfinder in 5 steps

GILYTICS

Define & Import Spatial Data

INPUT

Raw Data

GIS
Satellites
Cadastral
LiDAR

IMPORT
Shape, TIFF, ESRI .gdb, DXF, GEOTIFF, ASCII, etc.

Planning Rules Set up

- **Technical** constraints
- **Regulations**
- **Project** restrictions
- **Environmental protection** policies
- Etc…

Create Scenarios

1. **Resistance map** generation
2. **Corridors** generation
3. **Paths** generation

Review Analytics & Impact Analysis

- Visual impact analysis
- Ridge detection
- Spatial clustering
- Etc…

Reporting & Stakeholder Engagement

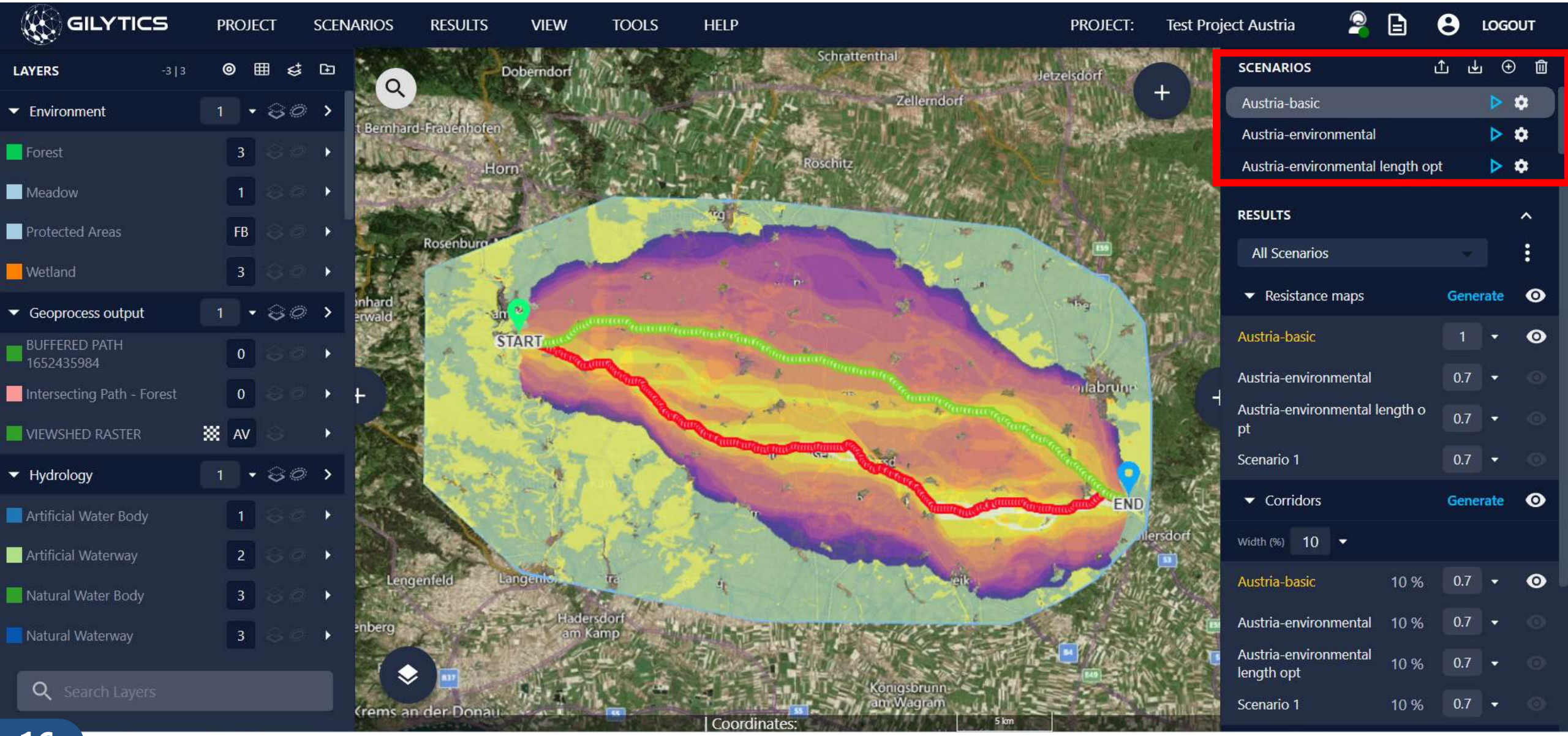
OUTPUT

Data Visualizations

3D Visualization Output compatible with PLS-CAD

EXPORT
Shape, TIFF, PNG, JPEG, BMP, DXF, GEOTIFF, ASCII, etc..

Pathfinder



Pathfinder

GILYTICS

Path Analytics, Paths:

Path Analytics, Layers: 49 elements selected

Min. Analytics Threshold [%]: 1

Max. Analytics Threshold [%]: 100

DESELECT ALL

Scenario 1 Environmental Team

- [x] Scenario 1 Environmental Team - Optimal

Scenario 2 Engineering Team

- [x] Scenario 2 Engineering Team - Optimal

Layer Path Coverage

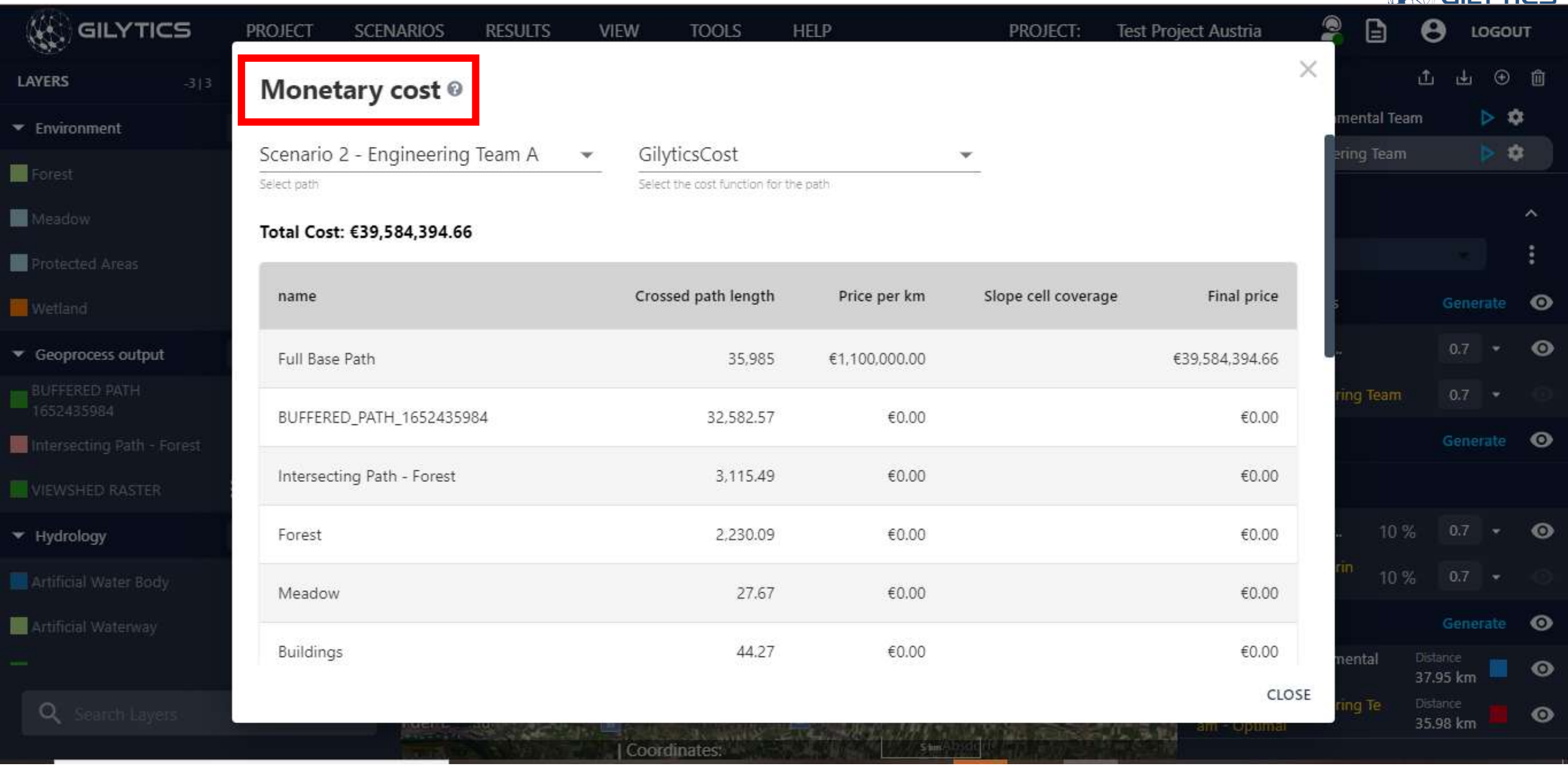
Path length for Scenario 2 - Engineering Team - Optimal: **36.0 Km** (11 Layers not visible in chart)

Path length for Scenario 1 - Environmental Team - Optimal: **38.0 Km** (7 Layers not visible in chart)

Urban

Social

- **Path Analytics**
- **Vertical Profile**
- **Resistance Profile**
- **Cost analysis**
- **3D Visualization**



Monetary cost

Scenario 2 - Engineering Team A

Select path

GilyticsCost

Select the cost function for the path

Total Cost: €39,584,394.66

name	Crossed path length	Price per km	Slope cell coverage	Final price
Full Base Path	35,985	€1,100,000.00		€39,584,394.66
BUFFERED_PATH_1652435984	32,582.57	€0.00		€0.00
Intersecting Path - Forest	3,115.49	€0.00		€0.00
Forest	2,230.09	€0.00		€0.00
Meadow	27.67	€0.00		€0.00
Buildings	44.27	€0.00		€0.00

CLOSE

Reporting

GILYTICS

Extract | scenario-Scenario 1-results (5).zip

Location: /scenario-1/project/

Name	Size	Type	Modified
area.cpg	10 bytes	unknown	22 décem
area.dbf	78 bytes	Xbase docu...	22 décem
area.prj	143 bytes	ESRI coordi...	22 décem
area.shp	348 bytes	ESRI shape ...	22 décem
area.shx	108 bytes	ESRI shape ...	22 décem
end_point.cpg	10 bytes	unknown	22 décem
end_point.dbf	78 bytes	Xbase docu...	22 décem
end_point.prj	143 bytes	ESRI coordi...	22 décem
end_point.shp	128 bytes	ESRI shape ...	22 décem
end_point.shx	108 bytes	ESRI shape ...	22 décem
start_point.cpg	10 bytes	unknown	22 décem
start_point.dbf	78 bytes	Xbase docu...	22 décem
start_point.prj	143 bytes	ESRI coordi...	22 décembre 2020, 12:56
start_point.shp	128 bytes	ESRI shape ...	22 décembre 2020, 12:56
start_point.shx	108 bytes	ESRI shape ...	22 décembre 2020, 12:56

REPORT GENERATOR

Lower Austria — GILYTICS

Table of Contents

Project
- Project Data
- Path Cost Summary
- Layers List
- Layer Path Coverage
- Path Profiles
- Path Resistances

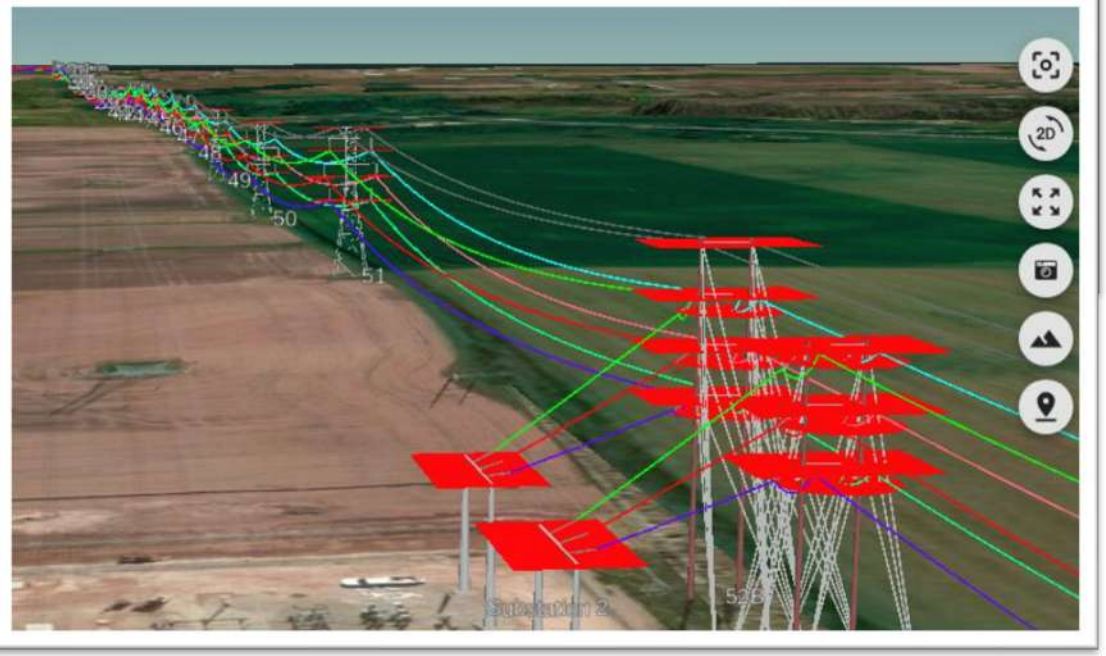
Scenario 1 - Sal_Bay
- Scenario Data
- Scenario Settings
- Category Weights
- Layer Resistances
- Layer Path Coverage
- Path Cost

Lower Austria
Project Data

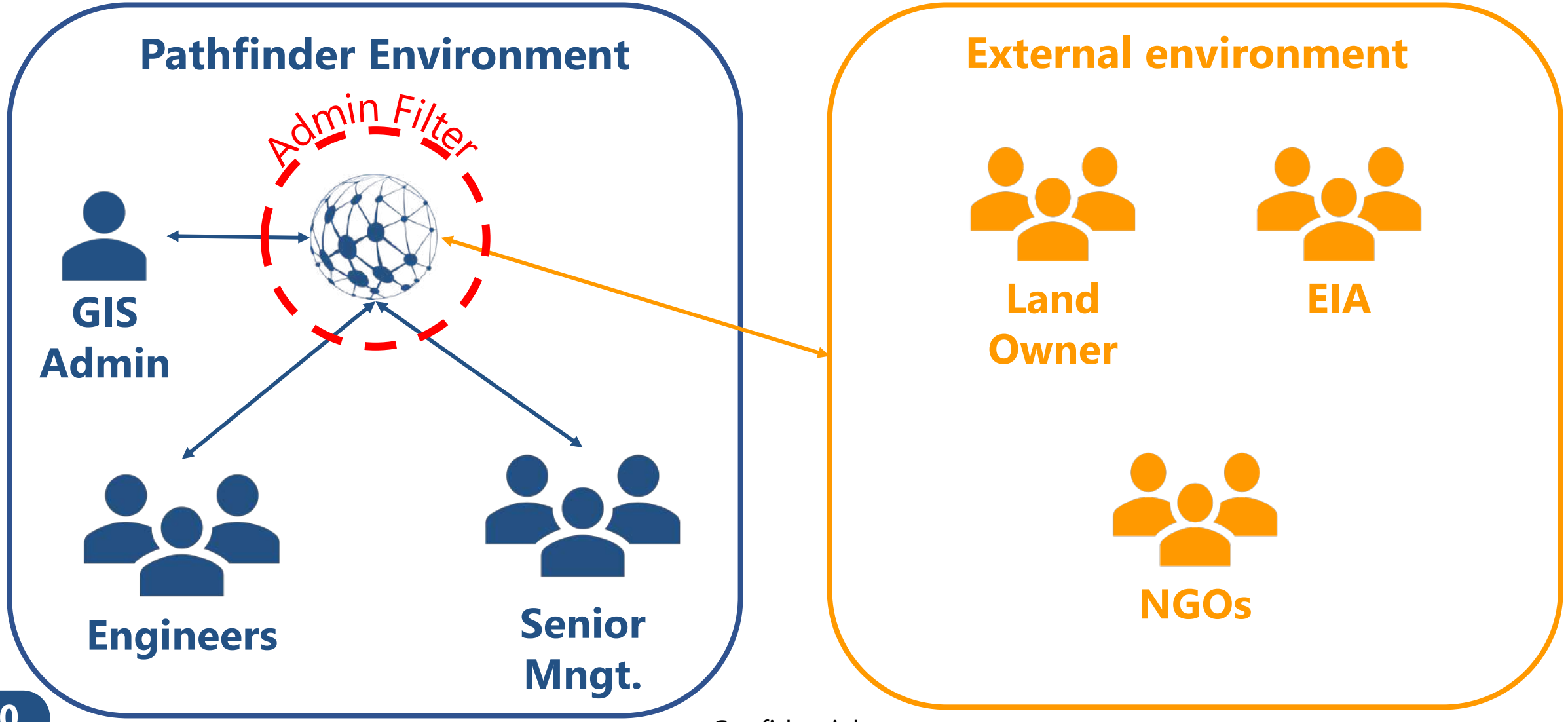
Report Elements

SIMPLE REPORT

Project
- Project Data
- Path Cost Summary
- Layers List
- Layer Path Coverage
- Path Profiles
- Path Resistances



Planning – Alternatives Review – Stakeholder Engagement



Stakeholders Engagement

GILYTICS

Smart data analytics

Data security

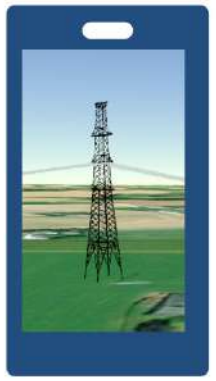
Optimization processing

Data&maps storage and database

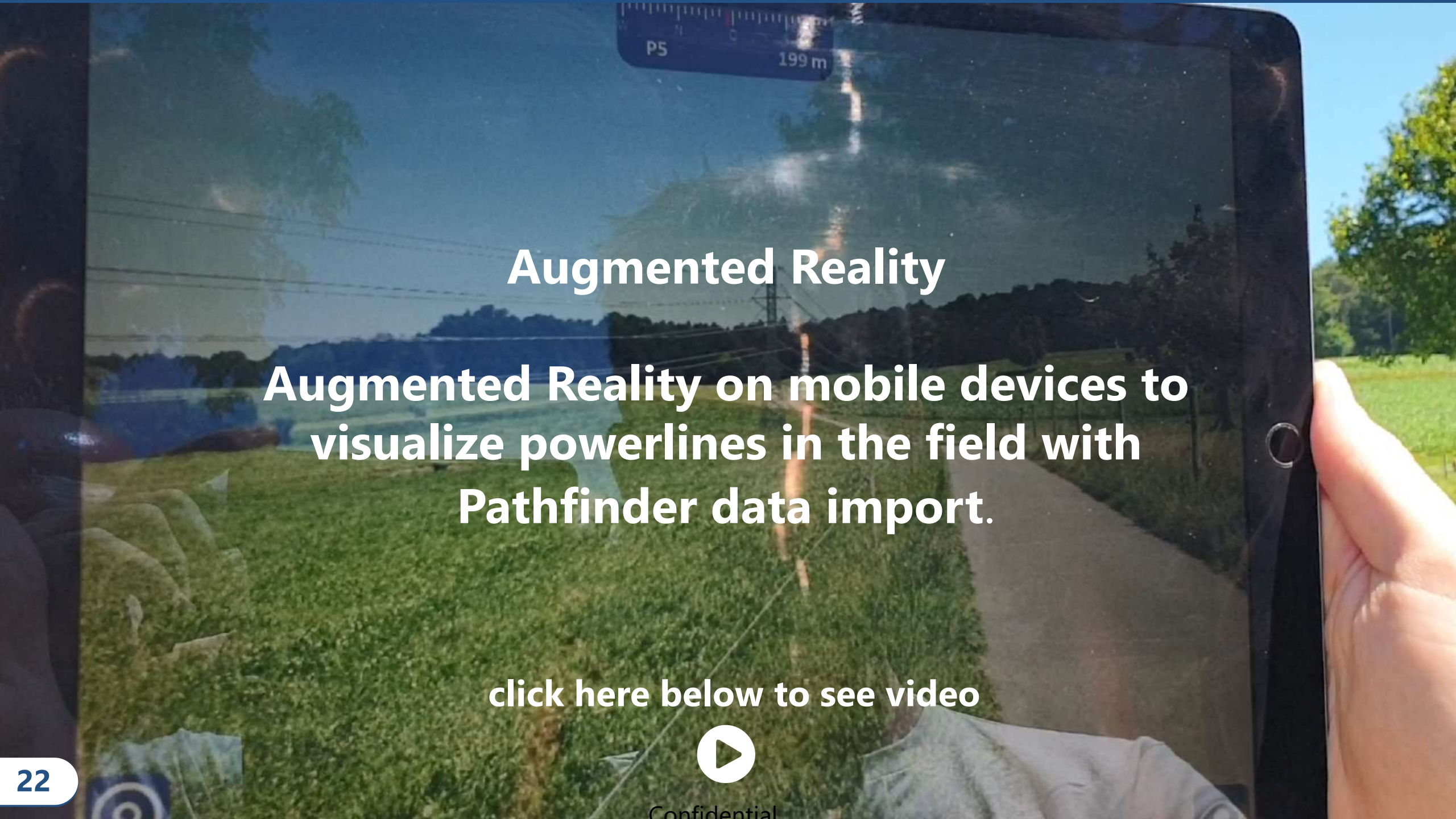
Web-application for optimal planning

Planners

Mobile devices for communication with AR/VR



Stakeholders



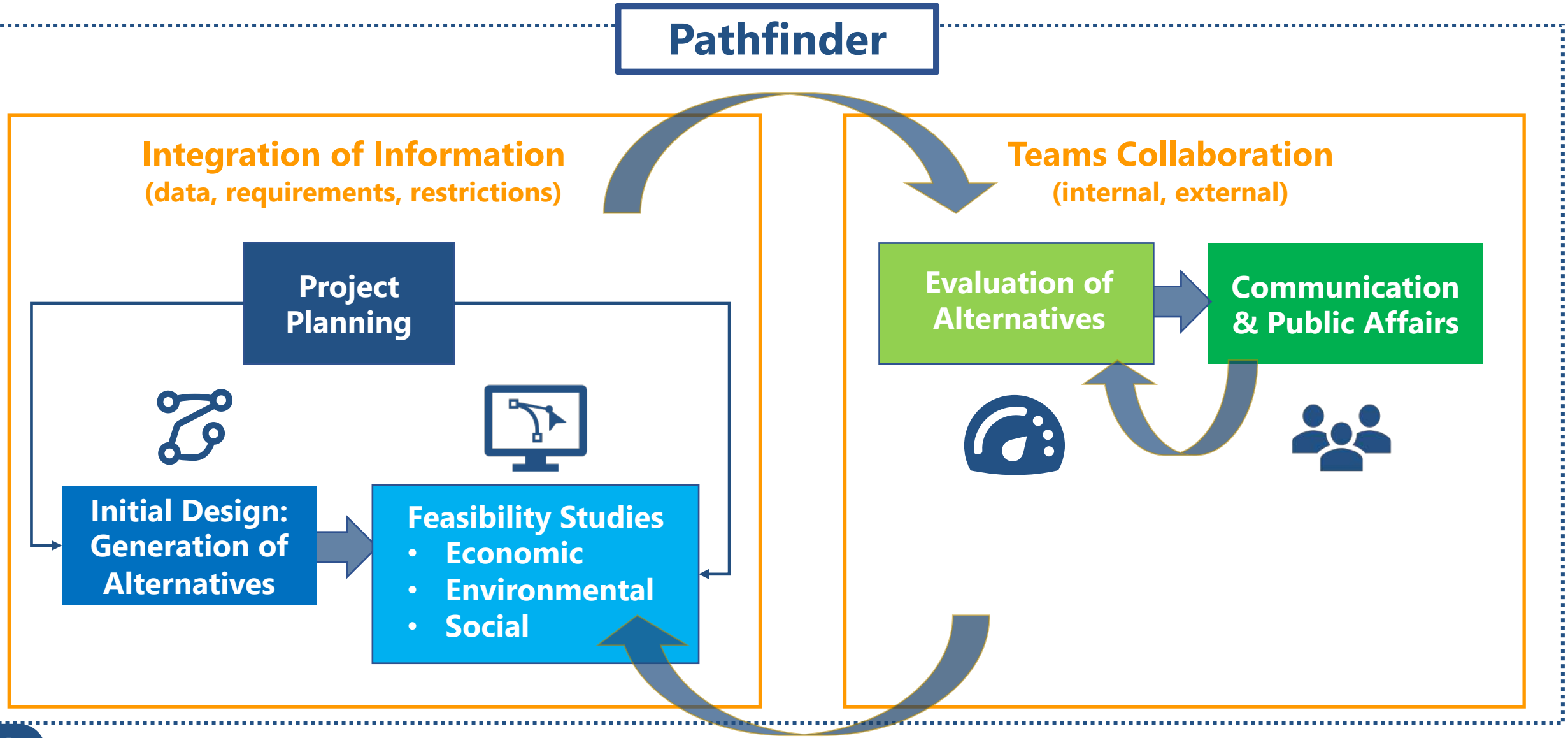
Augmented Reality

Augmented Reality on mobile devices to visualize powerlines in the field with Pathfinder data import.

click here below to see video

How Can We Help?

Project Stages & Pathfinder



Case Studies

Swissgrid Stakeholder Engagement

Joshu Jullier
Communication Manager
Swissgrid Ltd.

Case Study TSO

Swissgrid

Swiss National TSO operating extra high voltage grid

Challenge

Find residential and environmental friendly routes

Solution

Routes combining overhead lines and underground cable

Results

Corridors & paths analysis supporting decision making process

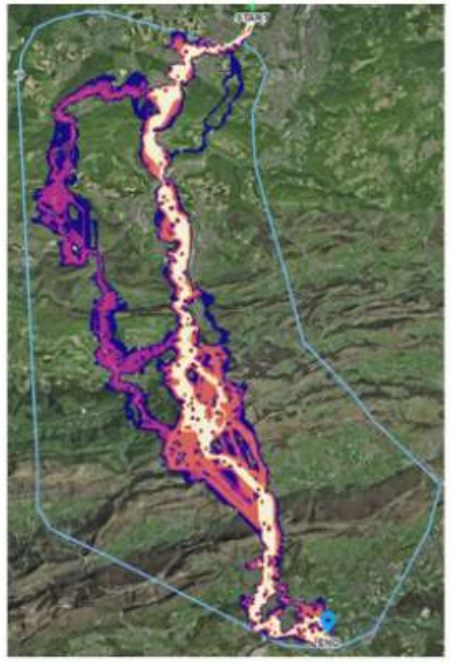
Using Pathfinder for the spatial planning phase

Define GIS data, assign spatial resistance

1

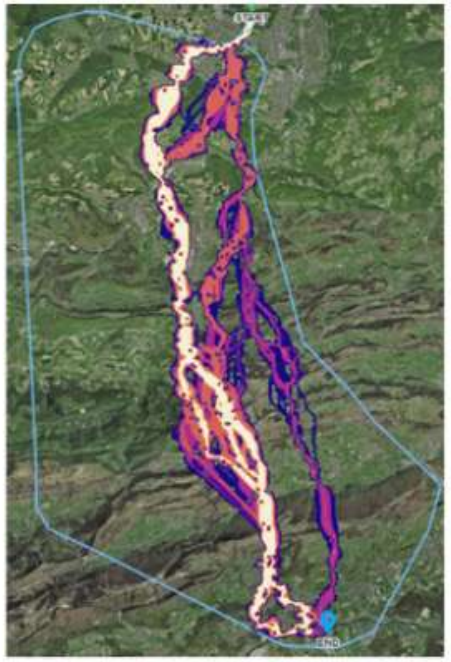
Calculate spatial resistence map

2



Structure the study area, recognise peculiarities

3

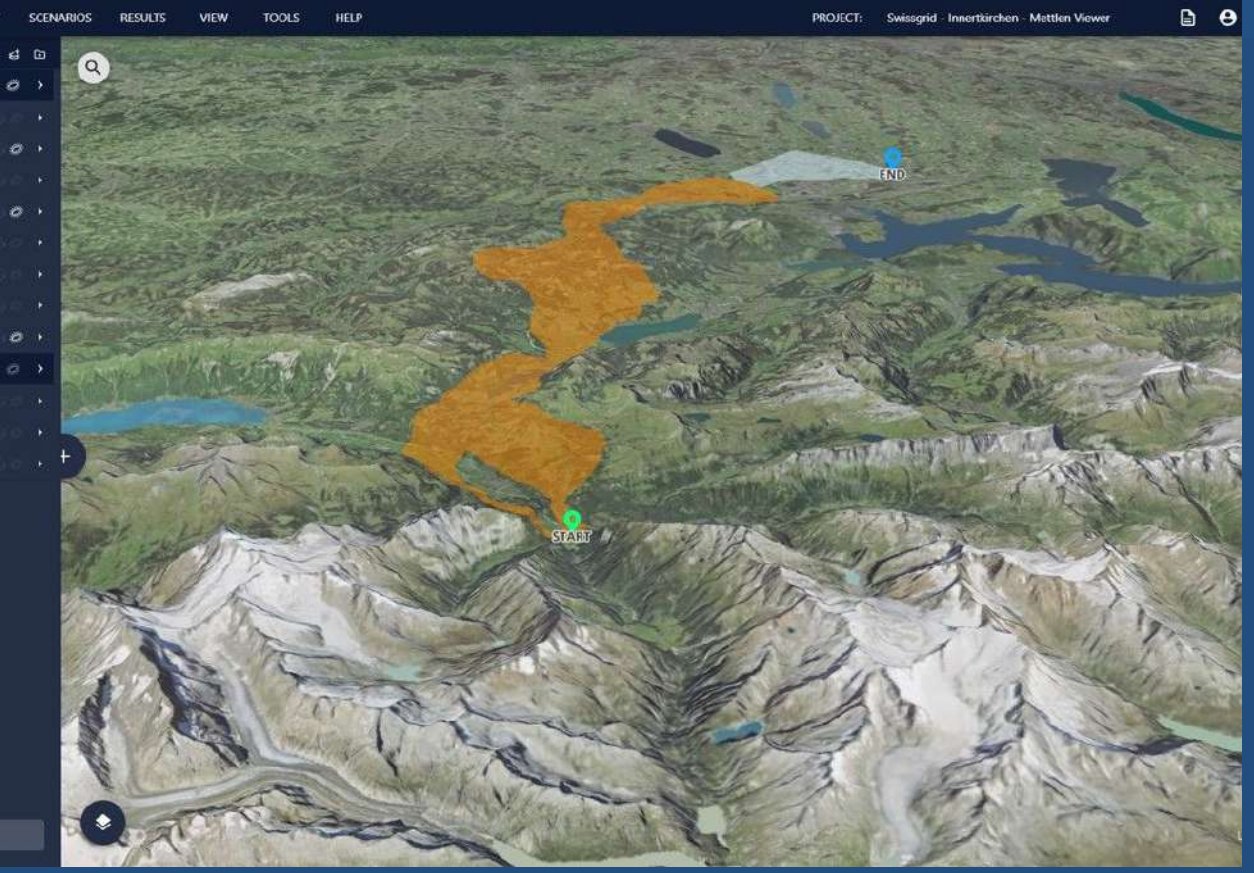


Create scenarios and sensitivity analysis

4

Determine and compare corridors and paths

5



Swissgrid Stakeholder engagement

- Simplified version of Pathfinder -> showing the important layers (as national protected areas) and the proposed corridors
- 2D & 3D visualization of corridors (and paths)
- Function to enable external users to use the viewer via weblink and submit comments: under discussion

Case Study DSO

Axpo

Largest Producer of Renewable Energy in Switzerland operating up to 110 kV power grid

Challenge

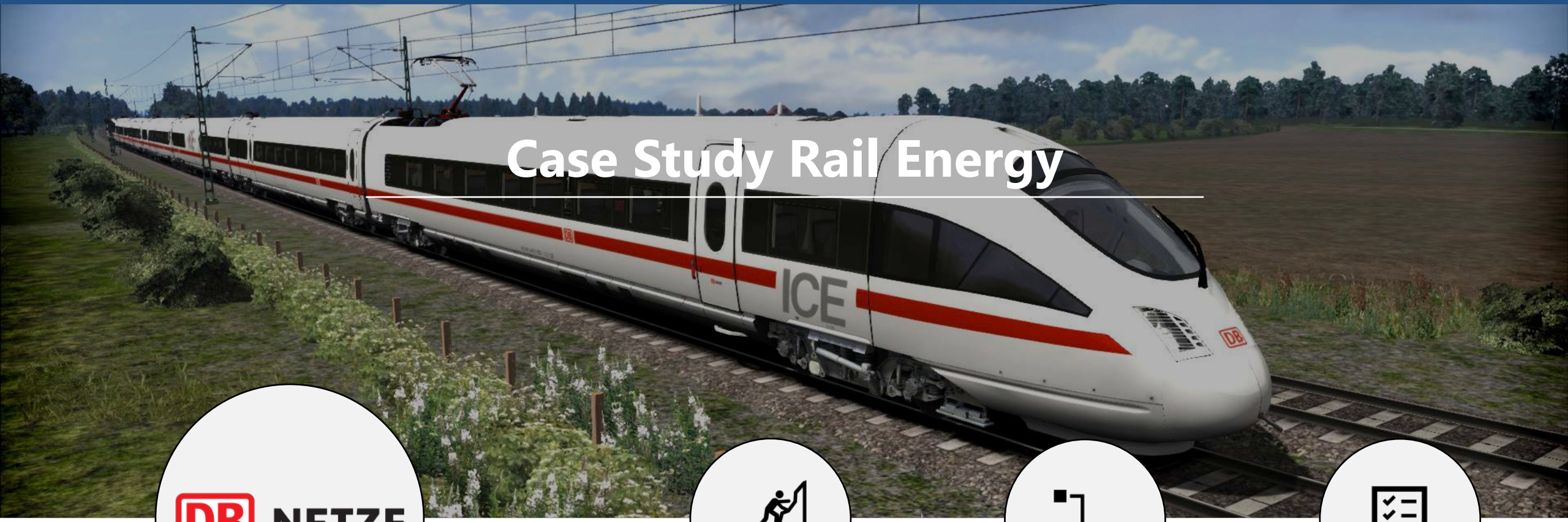
Finding cost efficient routes in heavy build up urban areas

Solution

Compute various Overhead Lines and Earth Cable routes

Results

Chose best route with automated reporting and line visualizations



Case Study Rail Energy

DB Netze

Largest Rail Operator in Europe operating a 110 kV power grid

Challenge

Find Overhead Powerline route close to the rail line in urbandized areas

Solution

Data model that helps bundle electric lines along rail line

Results

Compare route options along rail line with options away from it

Helping with Good Practices

Benefits

>50% faster project performance

6 months time savings

10%+ cost savings

Increased transparency & communication with stakeholders

Best Practices

- **Collaboration** platform for multidisciplinary teams (engineering, environmental, planning, etc)
- **Tailored analysis** and **modelling** per user requirement
- Allow **stakeholders** to **contribute** data and knowledge
- Ability to **share** alternatives and scenarios with different **stakeholders**
- **Enable stakeholder** to comment and take active part
- **Notify** relevant stakeholders on new information
- Usefulness for explanation and **story telling** during information days
- Increased **transparency** of routes & corridors selection

Thank You