

OCP Engineering Workshop 8th November 2017 – London UK

OCP Engineering Workshop – 8 November 2017 – London, UK

Site Analysis Tool

Romonet Ltd

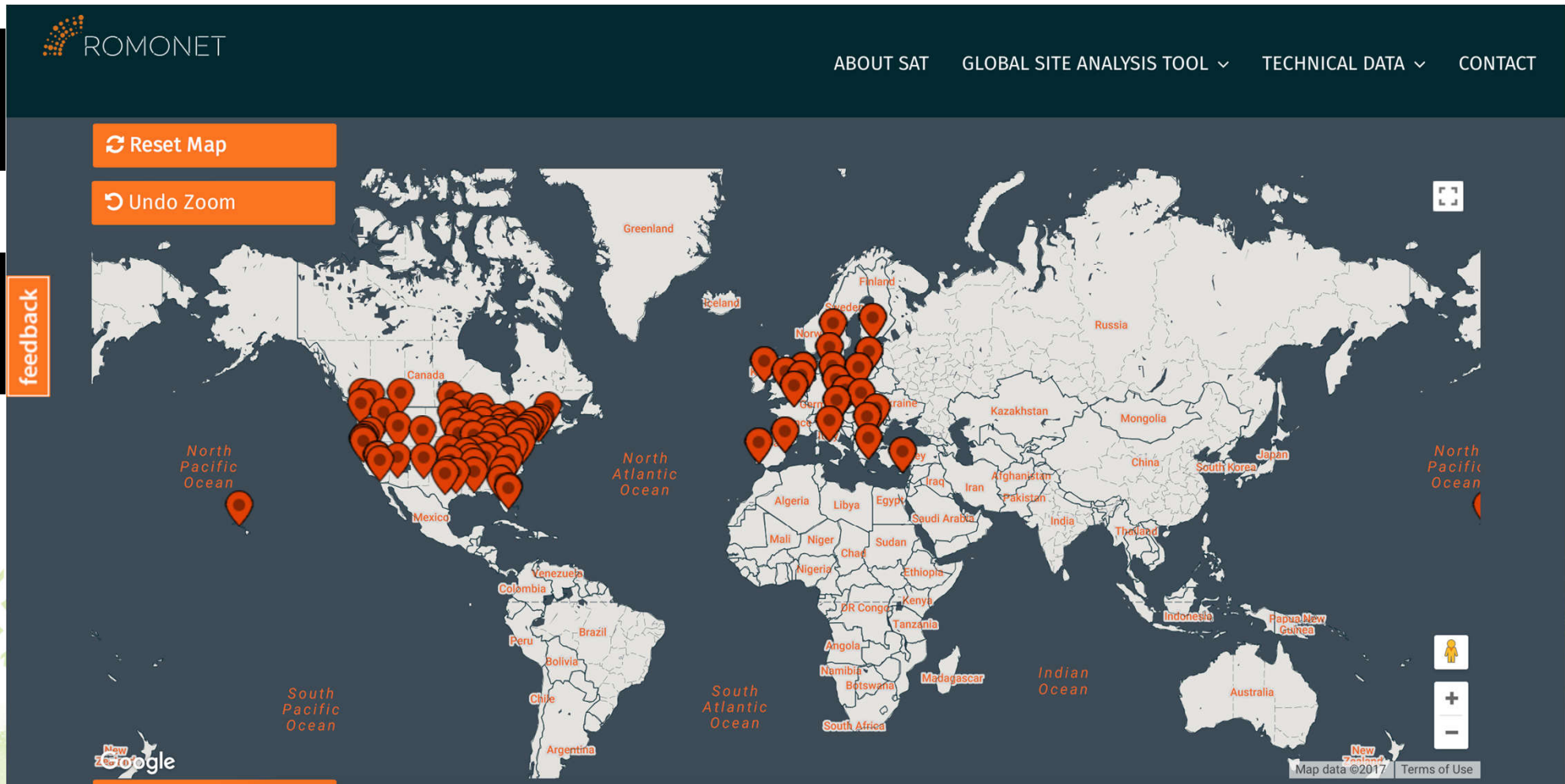
James Rix

Projects, Programmes & Service Delivery



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Romonet – Site Analysis Tool



Site Analysis Tool – Analysis Options

- **Data centre** - view how an archetype performs across all locations
- **Location** - view how all archetypes perform in a specific location
- **Compare Locations** - compare performance in up to five locations

Use column sort to find trade-offs



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Site Analysis Tool – Analysis Output

PUE – annual average PUE at % load

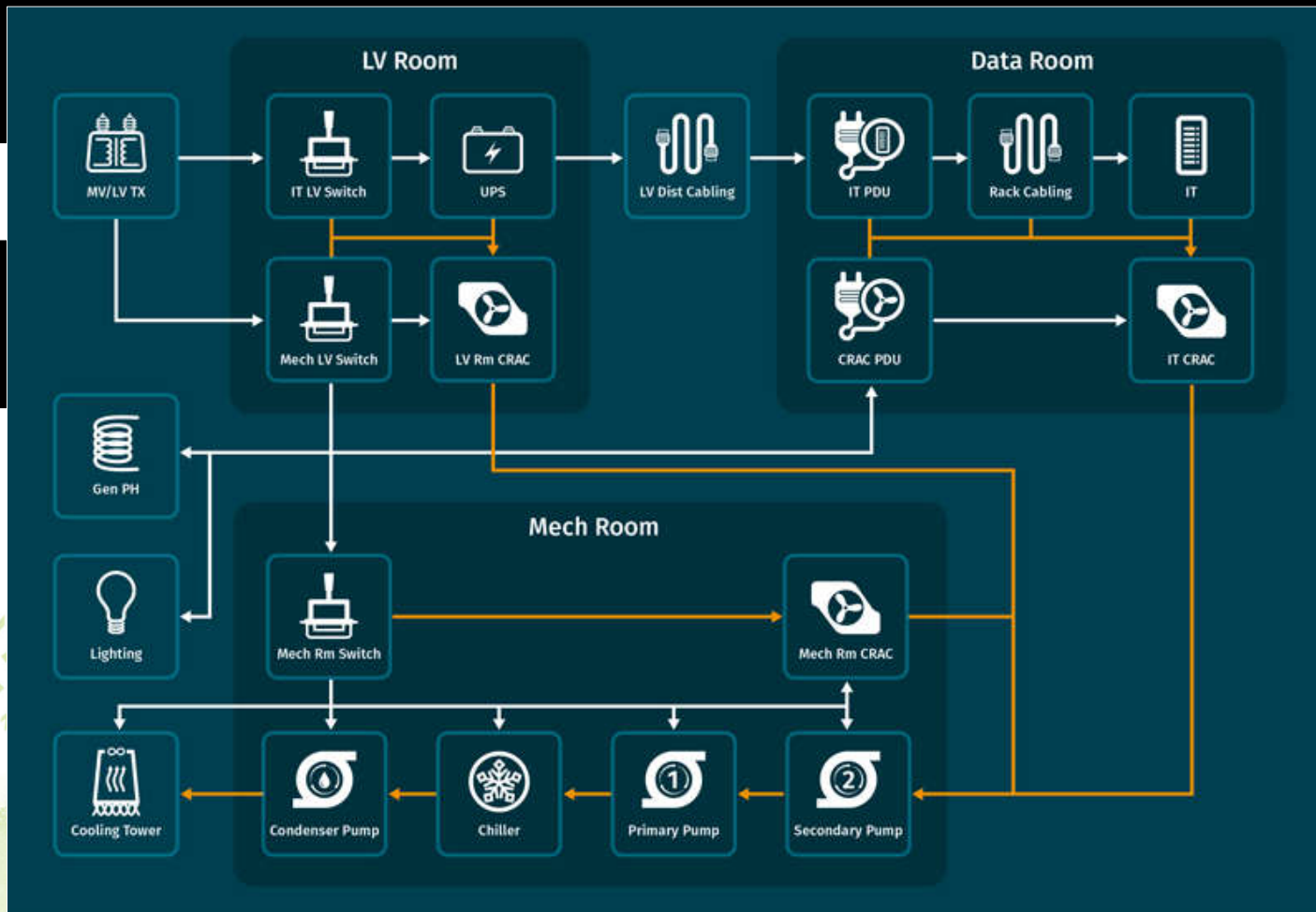
- **Annual Energy Cost** – based on % load

Total Annual Energy – annual energy consumption GWh

CO₂e – total annual CO₂e emissions

- **Utility Cost** – average grid energy per location \$/kWh
- **PUE Surface Plot** – PUE under all load's/OAT's

Site Analysis Tool – Predictive Models



Site Analysis Tool – Predictive Model

1MW – all models are sized to 1MW IT capacity

- **TMY Simulation** – fully TMY location data used for simulation

2N/N+1 – electrical / mechanical resilience (Tier/Class/Group 3)

ASHRAE R – target supply temperature

- **Single Hall** – non or partially contained hot/cold aisle

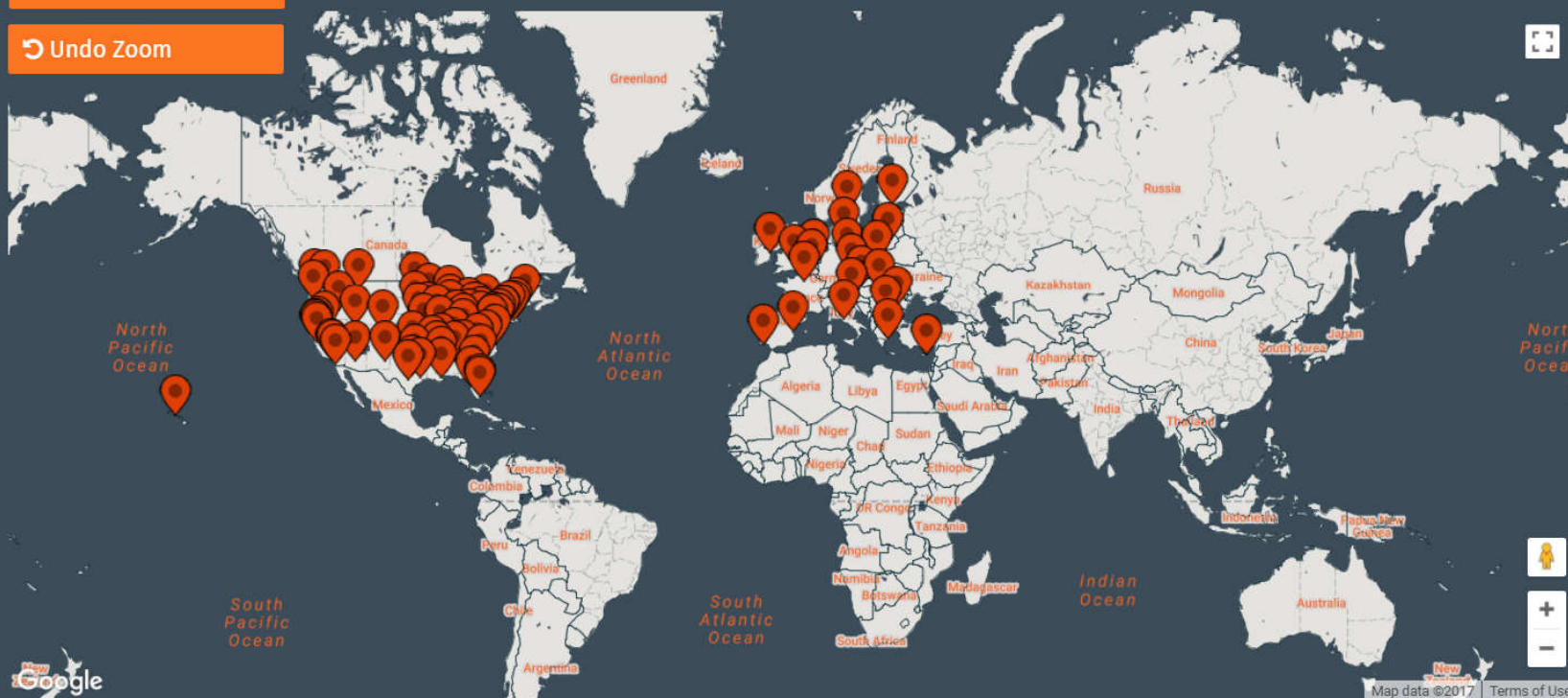
Over 1964 years of hourly simulation data!

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Romonet Software enables us to surpass energy reduction goals by over 9%;
not only understand the consequence|

Romonet provides predictive analytics software and services for the data center. It is the only cloud-based solution to provide data on a facility's entire lifecycle. This financial, environmental/CSR and operational information increases profitability, reduces risk and improves decision-making.

[Reset Map](#)
[Undo Zoom](#)


Site Analysis By Location

SELECT IT LOAD

☐ 25%

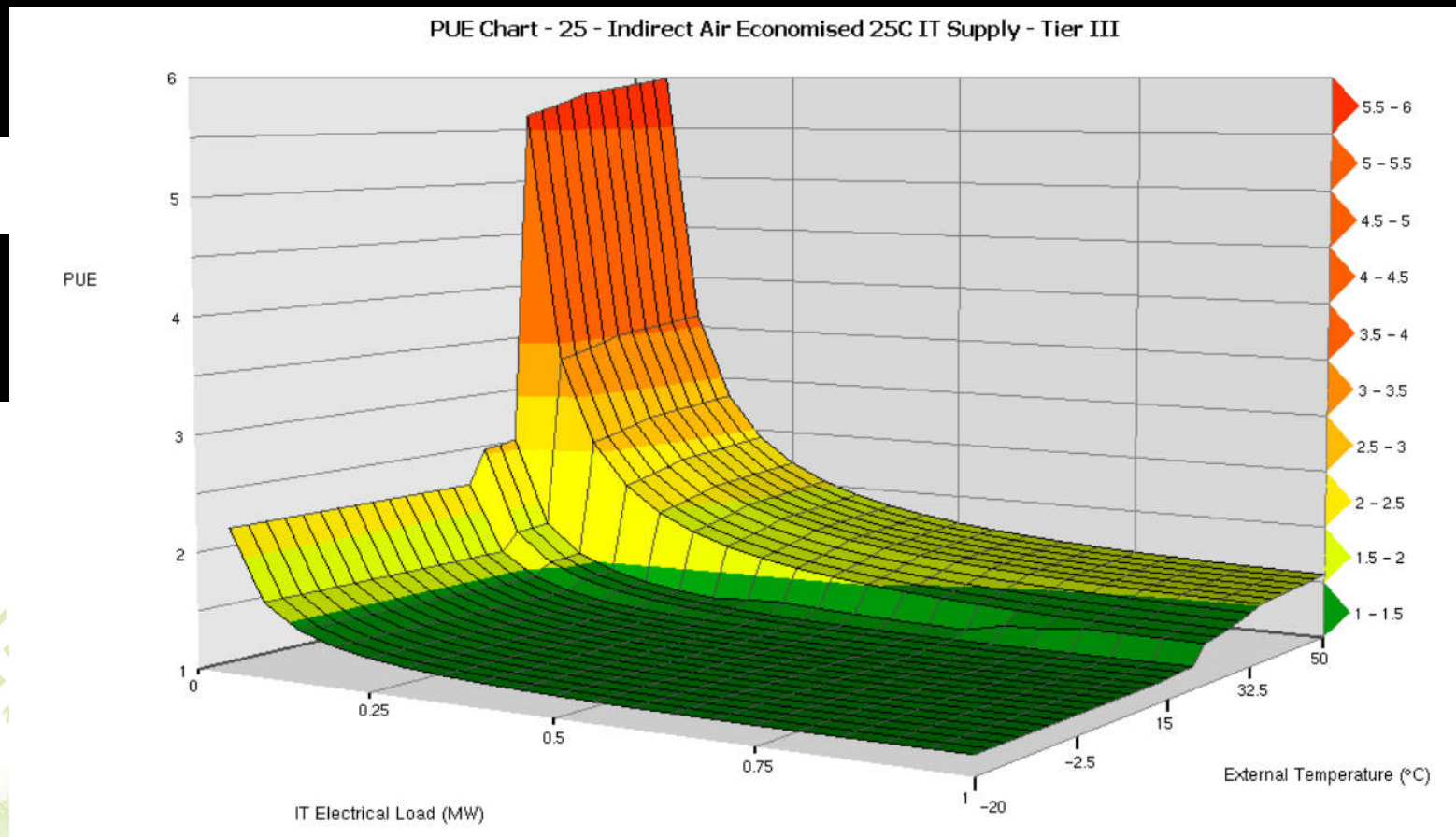
☐ 50%

☒ 75%

☐ 100%

DATA CENTER TYPE	ANNUAL AVERAGE PUE ▾	ANNUAL ENERGY GWh ▾	ANNUAL ENERGY COST US-\$m ▾	ANNUAL CO2 EMISSIONS CO2e(kT) ▾	UTILITY ENERGY COST USD ¢/kWh ▾	PUE SURFACE PLOT
Chilled Water with Cooling Towers	1.44	9.46	0.98	2.43	10.33	⬇
Economized Chilled Water with Cooling Towers	1.37	9.00	0.93	2.31	10.33	⬇
Indirect Air Economized	1.17	7.69	0.79	1.98	10.33	⬇
Adiabatic Direct Air Economized	1.18	7.74	0.80	1.99	10.33	⬇
OCP Adiabatic Direct Air Economized	1.16	7.62	0.79	1.96	10.33	⬇

Site Analysis Tool – PUE Chart – Surface Plot



Site Analysis By Location

Finland Helsinki

SELECT IT LOAD

25% 50% 75% 100%

DATA CENTER TYPE	ANNUAL AVERAGE PUE	ANNUAL ENERGY GWh	ANNUAL ENERGY COST US-\$m	ANNUAL CO2 EMISSIONS CO2e(kT)	UTILITY ENERGY COST USD €/kWh	PUE SURFACE PLOT
Chilled Water with Cooling Towers	1.71	3.75	0.39	0.96	10.33	↓
Economized Chilled Water with Cooling Towers	1.67	3.66	0.38	0.94	10.33	↓
Indirect Air Economized	1.29	2.83	0.29	0.73	10.33	↓
Adiabatic Direct Air Economized	1.30	2.85	0.29	0.73	10.33	↓
OCP Adiabatic Direct Air Economized	1.32	2.90	0.30	0.75	10.33	↓

SELECT IT LOAD

25% 50% **75%** 100%

DATA CENTER TYPE	ANNUAL AVERAGE PUE	ANNUAL ENERGY GWh	ANNUAL ENERGY COST US-\$m	ANNUAL CO2 EMISSIONS CO2e(kT)	UTILITY ENERGY COST USD €/kWh	PUE SURFACE PLOT
Larnaca : Chilled Water with Cooling Towers	1.46	9.60	2.79	6.84	29.06	
Larnaca : Economized Chilled Water with Cooling Towers	1.42	9.38	2.73	6.69	29.06	
Larnaca : Indirect Air Economized	1.27	8.34	2.42	5.95	29.06	
Larnaca : Adiabatic Direct Air Economized	1.21	7.94	2.31	5.66	29.06	
Larnaca : OCP Adiabatic Direct Air Economized	1.18	7.77	2.27	5.54	29.06	
Paris : Chilled Water with Cooling Towers	1.44	9.49	1.06	5.63	11.15	
Paris : Economized Chilled Water with Cooling Towers	1.38	9.10	1.01	5.40	11.15	
Paris : Indirect Air Economized	1.18	7.77	0.87	4.61	11.15	

Larnaca : Adiabatic Direct Air Economized	1.21	7.94	2.31	5.66	29.06	↓
Larnaca : OCP Adiabatic Direct Air Economized	1.18	7.77	2.27	5.54	29.06	↓
Paris : Chilled Water with Cooling Towers	1.44	9.49	1.06	5.63	11.15	↓
Paris : Economized Chilled Water with Cooling Towers	1.38	9.10	1.01	5.40	11.15	↓
Paris : Indirect Air Economized	1.18	7.77	0.87	4.61	11.15	↓
Paris : Adiabatic Direct Air Economized	1.18	7.77	0.87	4.61	11.15	↓
Paris : OCP Adiabatic Direct Air Economized	1.16	7.64	0.85	4.53	11.15	↓
Amsterdam : Chilled Water with Cooling Towers	1.44	9.49	1.22	4.65	12.90	↓
Amsterdam : Economized Chilled Water with Cooling Towers	1.38	9.09	1.17	4.45	12.90	↓
Amsterdam : Indirect Air Economized	1.17	7.71	0.99	3.78	12.90	↓

Site Analysis By Data Center Type

SELECT IT LOAD

OCP Adiabatic Direct Air Economized

25%

50%

75%

100%

LOCATION	ANNUAL AVERAGE PUE	ANNUAL ENERGY GWh	ANNUAL ENERGY COST US-\$m	ANNUAL CO2 EMISSIONS CO2e(kT)	UTILITY ENERGY COST USD ¢/kWh	PUE SURFACE PLOT
Paris France	1.16	7.64	0.85	4.53	11.15	↓
Berlin Germany	1.16	7.64	1.31	4.86	17.13	↓
Athens Greece	1.17	7.68	1.18	8.12	15.31	↓
Debrecen Hungary	1.16	7.64	1.04	3.54	13.63	↓
Dublin Ireland	1.16	7.64	1.36	4.46	17.83	↓
Rome Italy	1.17	7.71	1.77	2.78	22.88	↓
Kaunas Lithuania	1.16	7.62	1.09	1.37	14.26	↓
Amsterdam Netherlands	1.16	7.64	0.99	3.74	12.90	↓

Site Analysis Tool – Additions

- **OCP** – an OCP ‘style’ model based on OCP data center ‘spec’
- **CO₂e** – total Annual CO₂e emissions
- **Utility Cost** – average grid energy per location \$/kWh
- **H₂O** – annual water consumption as an output
- **New Locations** – Asia / South America / Canada

Free for anyone to use!



SITE ANALYSIS TOOL
— BY —
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Compute Project

