

OCP Engineering Workshop 8th November 2017 – London UK

OCP Engineering Workshop – 8 November 2017 – London, UK

Site Analysis Tool

Romonet Ltd

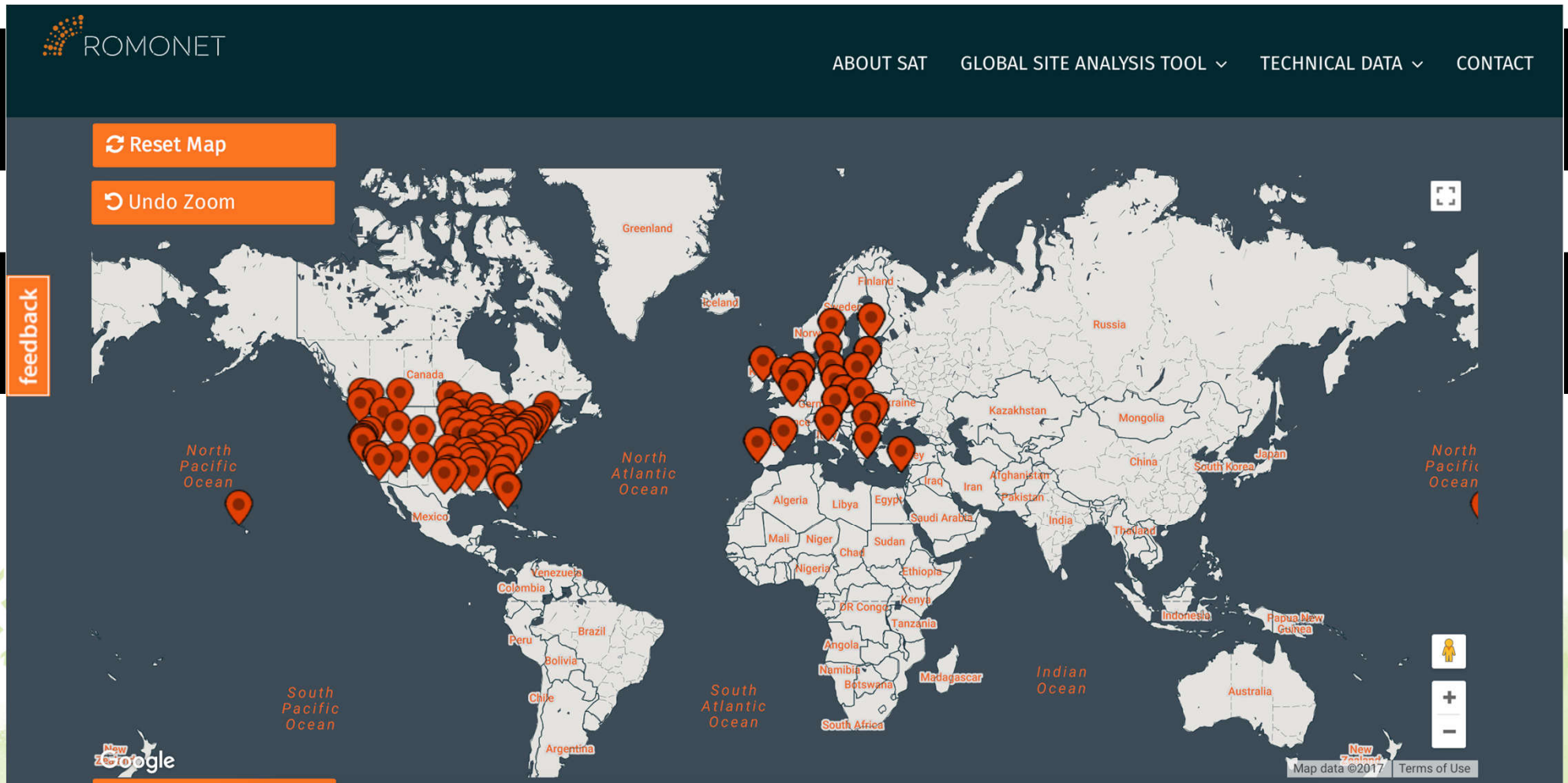
James Rix

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

Site Analysis Tool – Analysis Output

PUE – annual average PUE at % load

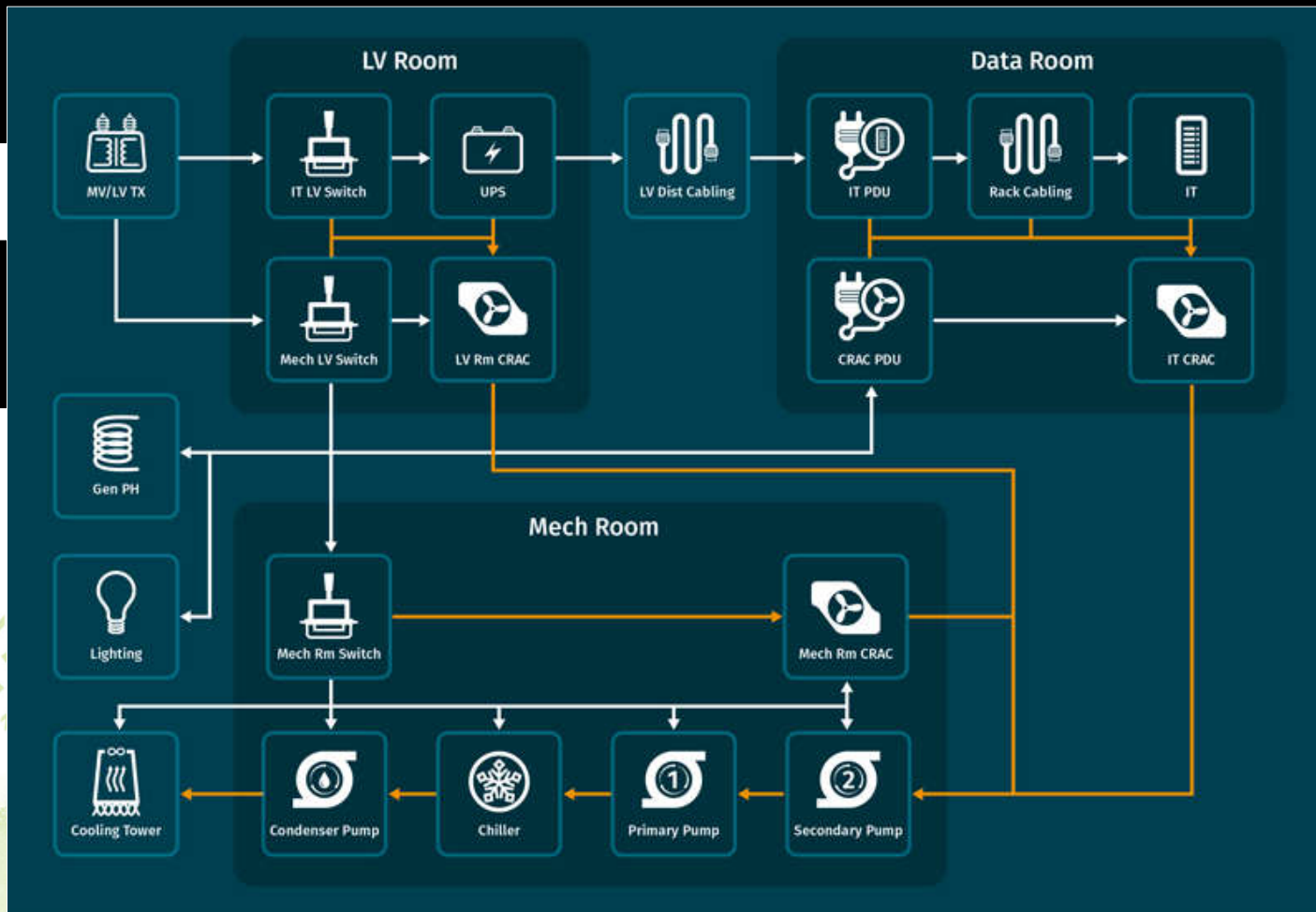
- **Annual Energy Cost** – based on % load

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

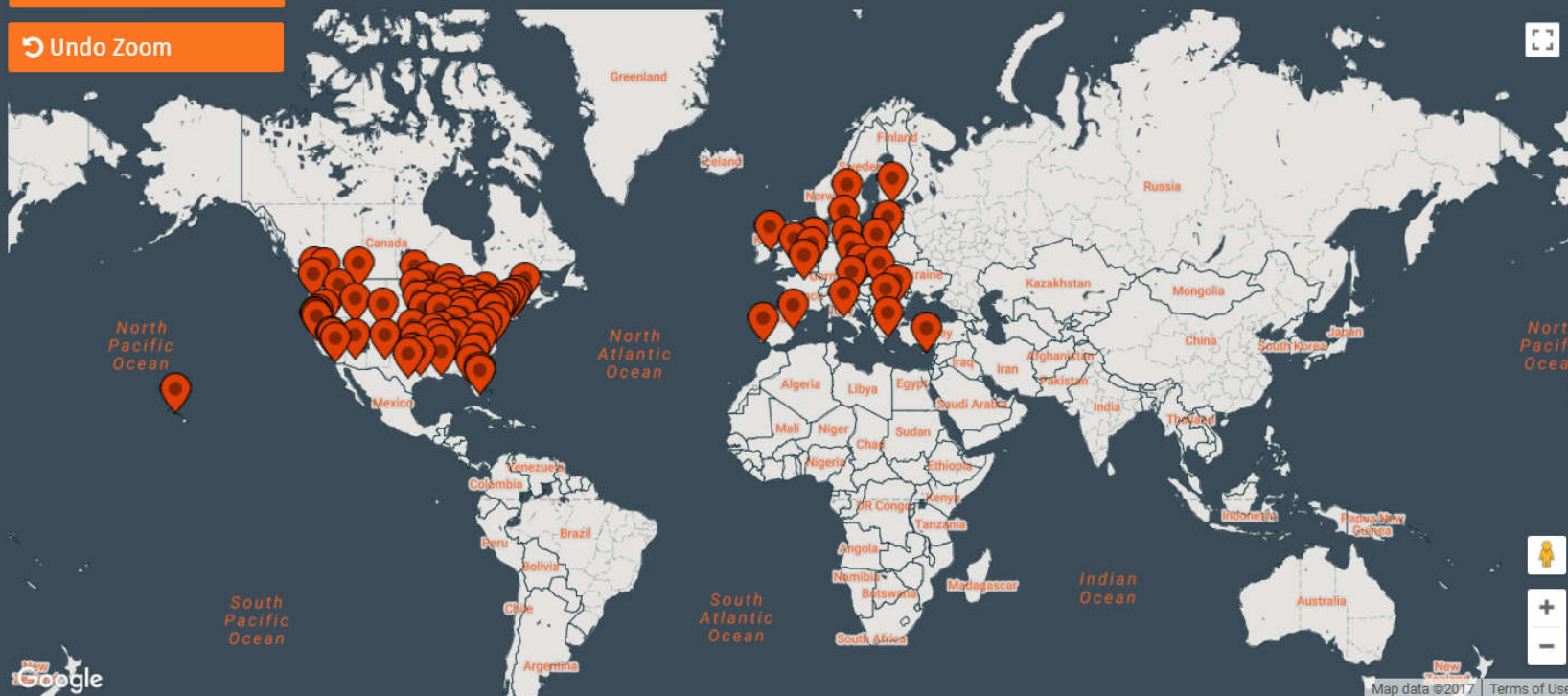
Over 1964 years of hourly simulation data!

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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%

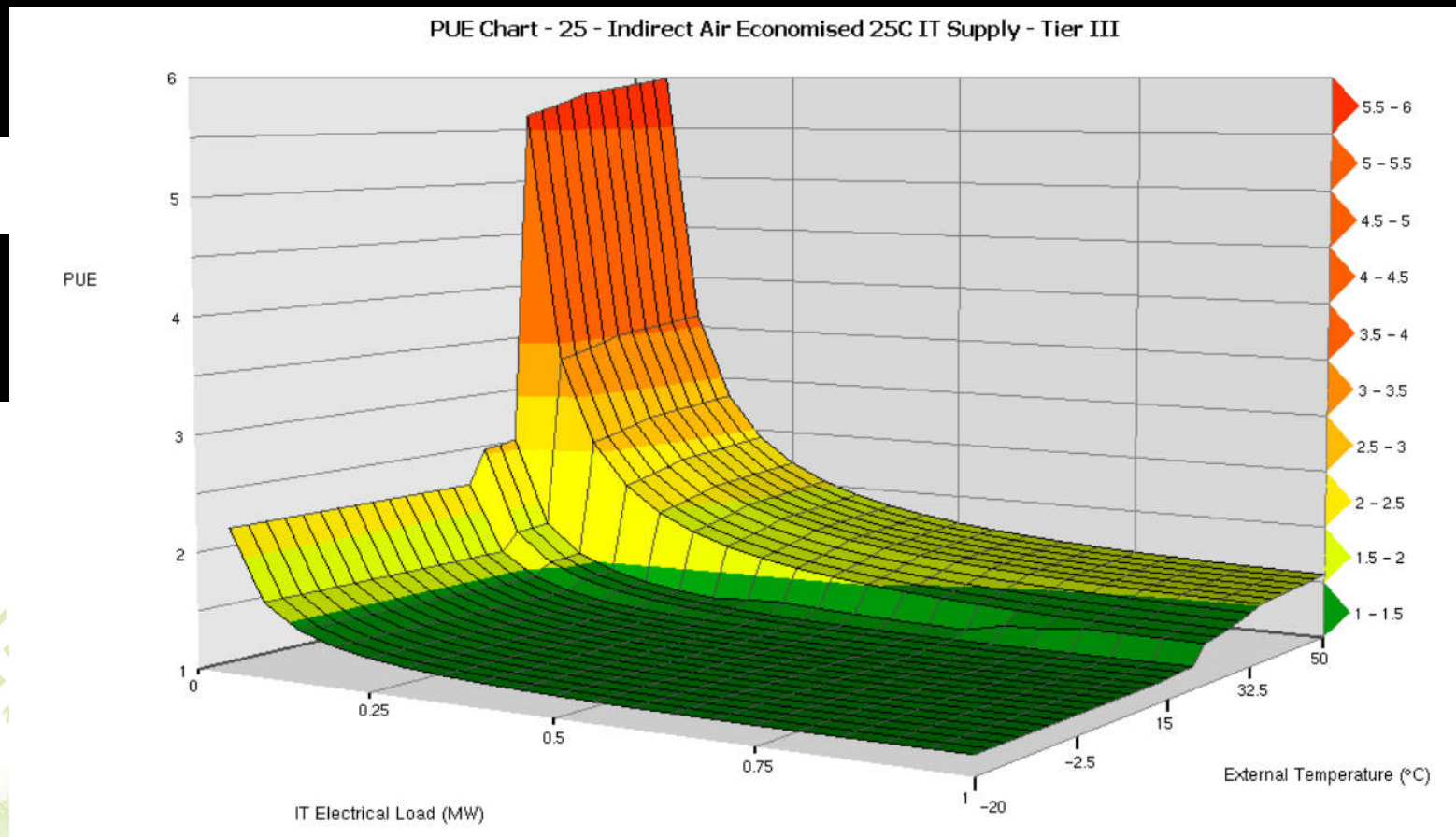
☐ 50%

☒ 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 —
ROMONET





OPEN

Compute Project

