

Sustainability in Education

Sustainability, simplified



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Guiding principles for schools

1) Operational Efficiency

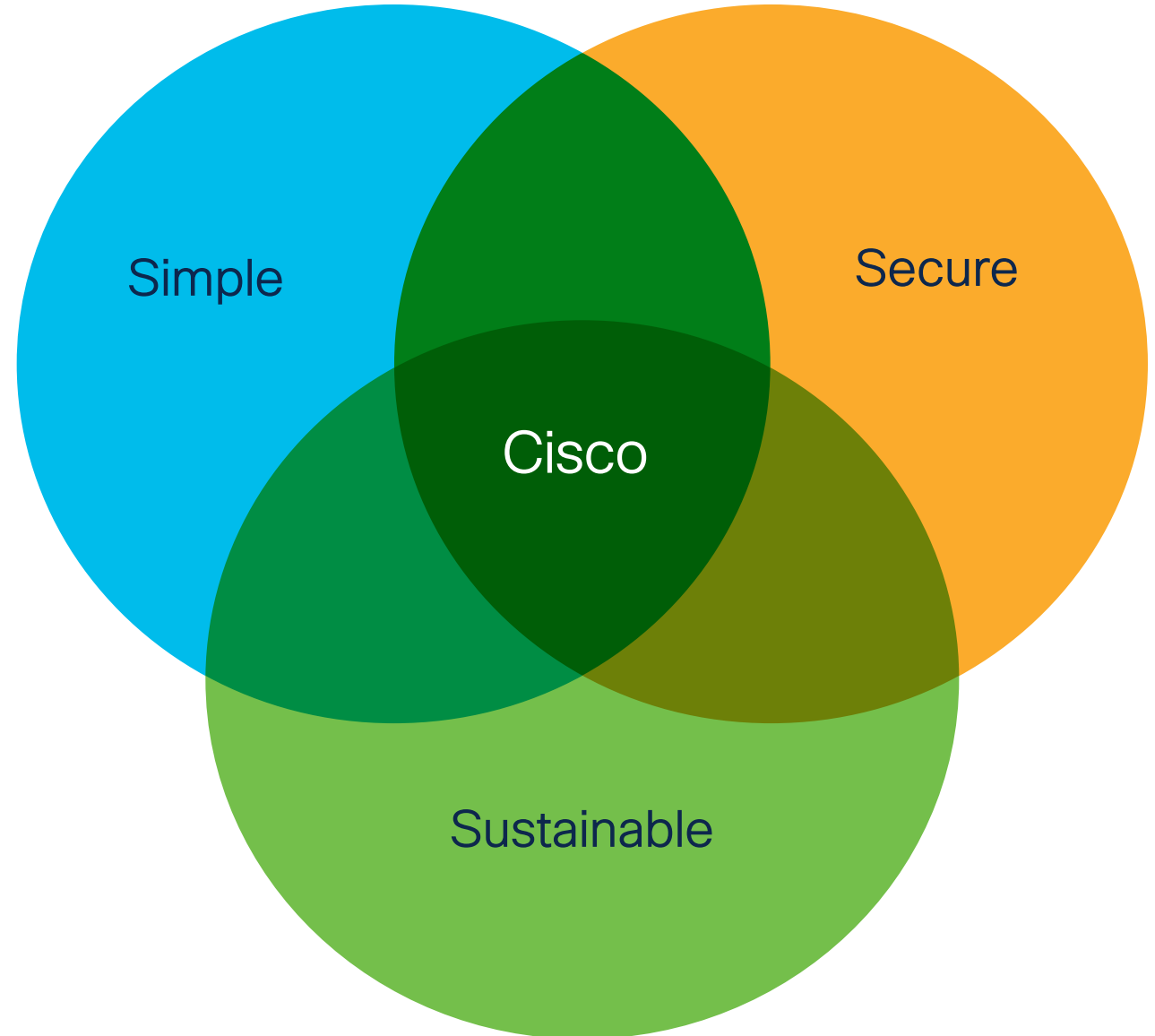
- Do more with less with Cisco

2) Security

- At School
- At Home

3) Zero Carbon Schools

- At design stage
- Monitor Air Quality





New goal:
**Net zero
emissions
by 2040**

Powering an Inclusive Future for All

Latest ESG ratings and rankings:



Leader-AA



A-



#1 in IT Industry,
Supply Chain Climate Action Index (SCTI)
and Green Supply Chain Corporate
Information Transparency Index (CITI)

Member of
**Dow Jones
Sustainability Indices**
Powered by the S&P Global CSA

Industry Best—Environmental
and Governance & Economic
in CMT Communications Equipment World
Index and North America Index

Fortune
World's Best
Workplaces
2021

#2

www.cisco.com/go/csr

Sustainability outcomes driven by Cisco Meraki

Energy Savings

- Cloud-delivered backend
- HVAC* Efficiency
- PoE Port Schedules
- Automation

*Heating, Ventilation, and Air Conditioning

- Commercial buildings contribute to 6.6% of global CO2e Emissions (ourworldindata.org)

Reduce Waste

- Protect perishable goods
- Protect business assets

- Waste (landfill and wastewater): 3.2% of global CO2e Emissions
- Food loss and waste: 6% of global CO2e Emissions (ourworldindata.org)

Reduce Travel

- Cloud-management
- Zero Touch deployment
- Hybrid Work
- Cameras and Sensors

- Avg. car: ~170g CO2e/km
- Nat. Return Flight: ~245g CO2e/km
- National rail: ~35g CO2e/km (UK Gov GHG Conversion Factors for Company Reporting 2022)

Typical Sustainability Challenges

Discover

Collect data and metrics for baseline assessments.

Identify opportunities for optimizations such as energy savings.

Act

Apply configurations and implement changes to achieve sustainable outcomes.

Report

Quantify achieved savings and document progress towards sustainability goals.

At scale across 10s – 1,000s of locations



Discover

Understand your PoE power usage

Ethernet Power Details

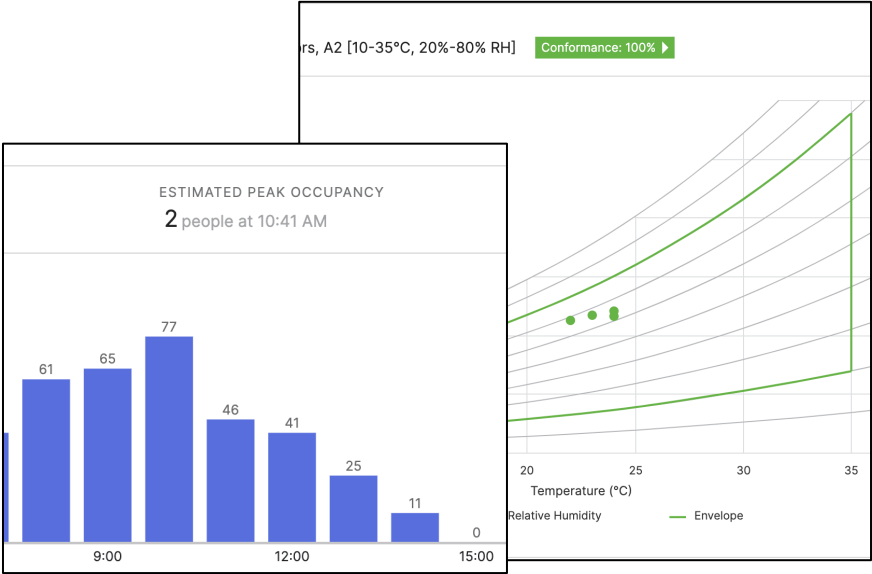
Power rate over time



Opportunities for energy savings with Power over Ethernet devices

Focus on energy usage out of business hours

Understand your spaces



Opportunities for energy savings through HVAC optimization

Insights into how many people are occupying your spaces

Understand your network

Clients



Insights into how many clients are using your network / WiFi

Focus on potential to Switch off inessential services or components during quiet or out of business hours

Act



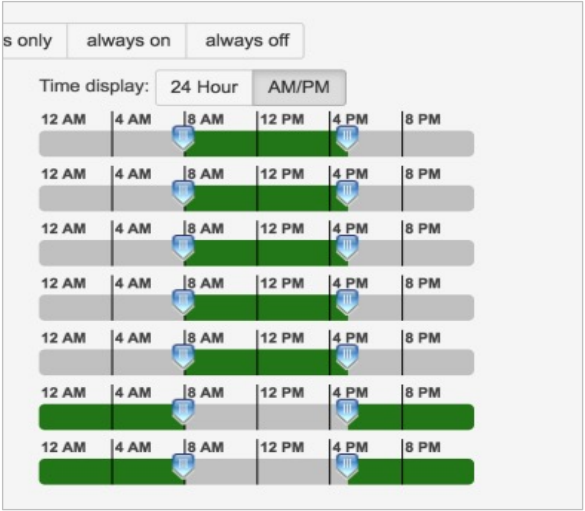
Dashboard API

```
{  
  "transmission": { "enabled": false }  
}
```

Deactivate WiFi-Transmission radios

Achieve Energy Savings when
all or some WiFi Access Points are not required

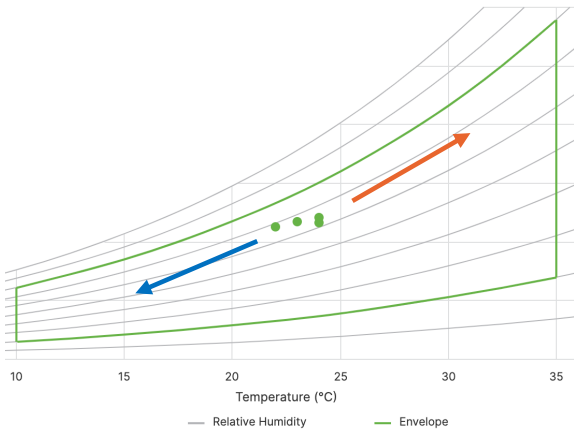
Out of business hours, in quiet hours,
In case of underutilized office space



Apply Port Schedules to deactivate
PoE-powered devices

Power down devices in quiet and
out of business hours

rs, A2 [10-35°C, 20%-80% RH] Conformance: 100% ▶



Adjust your HVAC to **increase** [**decrease**]
the ambient temperature

to optimize for energy savings

Monitor the temperature change in Dashboard
Or export the data via API/MQTT for full automation



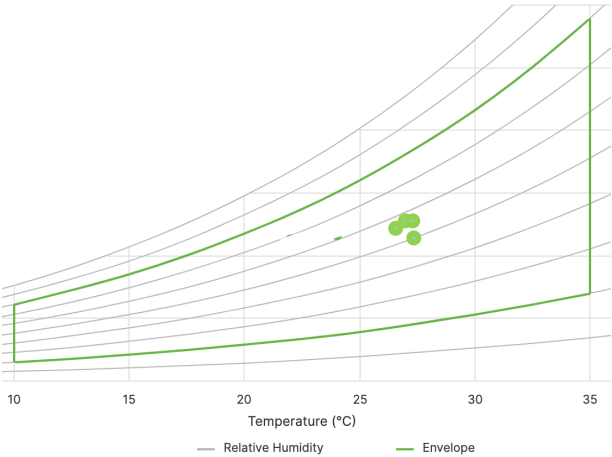
Report

Ethernet Power Details

Power rate over time



rs, A2 [10-35°C, 20%-80% RH] Conformance: 100% ▶



Dashboard API

```
"temperature": {
  "fahrenheit": 77.81,
  "celsius": 25.45 },
"humidity": { "relativePercentage": 34 },
"tvoc": { "concentration": 100 },
"pm25": { "concentration": 100 },
"noise": {
  "ambient": { "level": 45 } },
"indoorAirQuality": { "score": 89 },

"powerUsageInWh": 55.9
```

Close the loop and verify the changes you made in Dashboard

And export the achieved outcome and savings for permanent storage or processing in external systems via API



Cisco Meraki Switch Port-Schedules

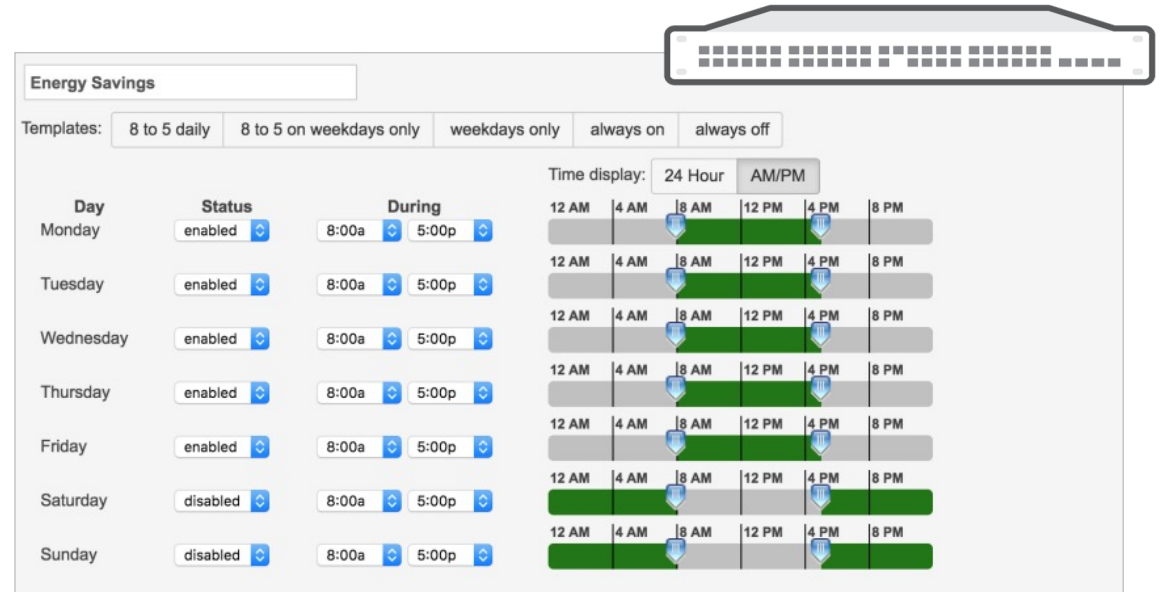
Switch off devices such as Access Points and IP phones when they are not required – out of business and office hours.

Switching off 2,000 Access Points (PoE+, 10W) for 10 hours per day saves up to (ca.):

75 tons of Co2e emissions
364,000 kwh energy
£100,000 cost

over 5 years.

(based on UK IEA emission factors 2021 and average tariff of £0.28 / kwh).



Further
resources

[Cost Savings Guide](#)
[Ethernet Power Study](#)

Automation

Endless possibilities



Event

No people detected

Temperature threshold reached

Motion detected

Action

Switch WiFi off

Send alert SMS/E-Mail/Snapshot

Send alert

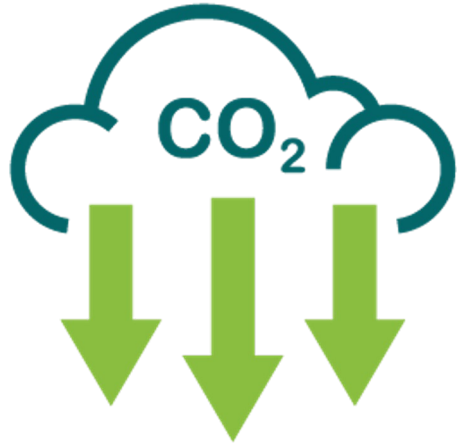
Sustainability outcome

Energy savings

Loss of assets / waste avoided

Travel avoided

Energy Consumption & Costs Reduced by 27% per Site



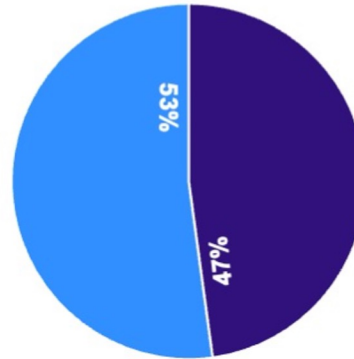
2.09 PUE (MER)

POST OPTIMISATION

Annual IT energy consumption at Sea Containers

£135,000
energy cost

210 tonnes
carbon emissions

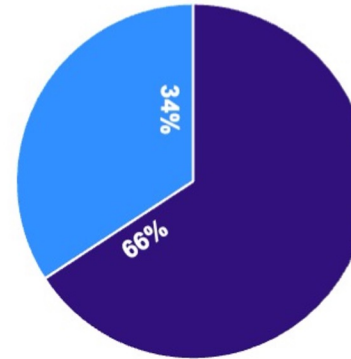


■ IT Equipment ■ Heating, Ventilation & Cooling



£98,550
energy cost

153 tonnes
carbon emissions



■ IT Equipment ■ Heating, Ventilation & Cooling

+£36,450
energy savings

+57 tonnes
carbon reduction

44%
cooling energy
reduction

27%
total energy
reduction

1.52 PUE (MER)

What Does It Mean To Be Sustainable?

4 Pillars of Thought

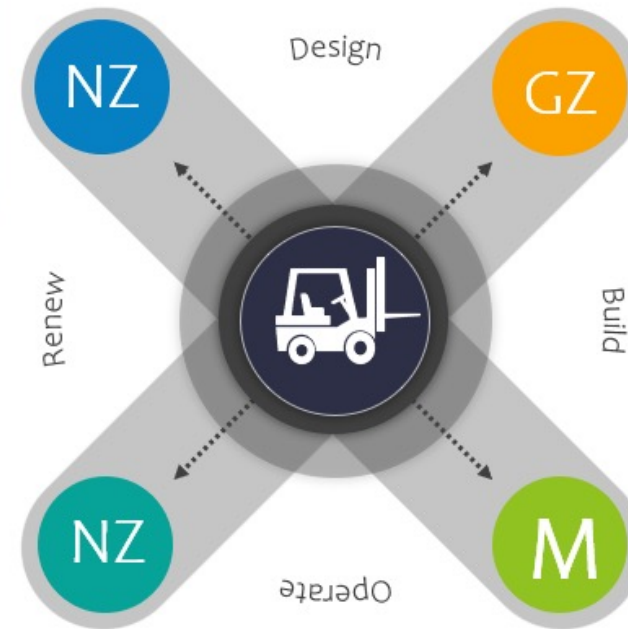
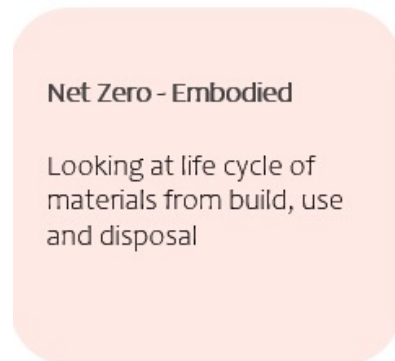
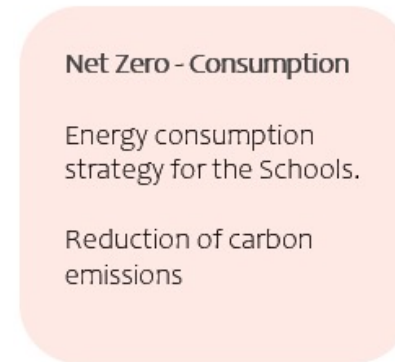
Definitions around sustainability

Deciphering the planning, design, build & operation of education settings.

Putting Pupils At The Heart Of Learning

Teaching new facets behind being sustainable.

Learning what the information tells them about their environment.



Gen Zero

Pilot to do with a particular ways in which buildings are designed.

- Modular design language to support:
 - Net Zero Operation of structures
 - Net Zero in build lifecycle

- Student Exposure to poor air quality
- Particulate matter analysis
- Harmfully organic compounds
- Desire for the pupils to engage with technology

Schools of the Future

GenZero was a research project that concluded in 2021 and was designed to consider innovative approaches for the delivery of Net Zero schools – both in operation and embodied. Three pilot educational settings were chosen to pilot some of the approaches and materials suggested in the final report:

Key highlights:

- Highly modular, including offsite fabrication of rooms, e.g. plant room
- Wooden construction throughout, Glulam beams, no paint
- Multi-purpose, flexible rooms
- Service spine walls, and no conventional dado
- Biophilic
- Net Zero in operation AND embodied
- Separate blocks for discrete functions
- Built to a standard grid
- Highly insulated, naturally ventilated where possible



Pilots across the UK – 5 Schools

Partnering for Success

- Early buy-in from Business units
- Building true partnerships and buy-in from all stakeholders
- Effective and early engagement with partner organisation (Softcat)
- Securing buy-in from CDA



Installation effective and flexible

Installation effective and flexible

- Accommodated every request put forward
- Worked to meet a short timeframe
- Worked to variable times on site
- Secured labor attendance to site during weekend and additional labor to accommodate short lead times.
- Early notification of the issues and associate rectification plan

Going Green Can Save Money

The Discovery

Thanks to the data on view, one of the pilot schools was able to **discover** lingering chemical particles in the air overnight.

Many of these were **still lightly present** in the early hours before the building was open to pupils.

Outcome



As a result, the cleaning company was able to swap out the detergent used for a more **environmentally friendly agent**. The facilities management team also noted that the product would offer significant long term cost savings.

Implementation Learnings

Summary of Pilots

- Good selection of schools that gave us a flavour of what we can expect going forward; old and new infrastructure
- Differing networks and building structures informed us considerably to aid what our information gathering requirements would need to include during survey.



Building Knowledge

- Mapped particular features of the schools that impacted on deployment approaches and/or requirements.
- Density of wall, distances on floor plans, age of construction and current connectivity onsite are good early indicators.
- Keeping all stakeholders informed and aware of the work being undertake before, during and after.
- Giving the schools visibility of what the technology is uncovering.

Thank you!