BlueXP Sustainability Dashboard

User Experience Research

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UX Designer: Dylan Dickey

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Agenda

- Research Goal
- Audiences of the dashboard
- Takeaways
- Result Deep-Dive
  - Theme 1 Current state
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  - Theme 3 Their current role and responsibility
  - Theme 4 Current tool/ software
  - Theme 5 Navigate to the dashboard from the home page
  - Theme 6 Main objectives and tasks
  - Theme 7 Usability of the dashboard

Research Goal & Methodology

What do we want to learn?

- Understand the core audience of the Sustainability dashboard.
- Measure effectiveness and customer satisfaction with the sustainability dashboard.
  - Is the data complete and useful?
  - Do you understand what actions to take to improve your sustainability?
  - Does it help you make your sustainability pitch to your management?

Part I: Screener Survey

The survey helped to identify the audiences of the dashboard as follows:

- Their on-premises data center
  1. Data center owners- The group of people whose company owns their data center
  2. Who has storage in a 3rd party-owned data center
- Roles in organization-
  1. Storage infrastructure professional
  2. Storage infrastructure manager/director
  3. Data center manager or operator

Part II: Moderated Interviews

- Participants of this study were representative of Sal
  - 4/5 of the participants are current NetApp customers.
  - 1/5 of the participant is NetApp partner/reseller.
- A list of participants' company
  1. National Institutes of Health (NIH)
  2. Xylem Inc
  3. HCL
  4. Micron
  5. Storage Hawk

Key Takeaways

- Our user interviews revealed that **while sustainability isn't a top concern right now, interest is growing**

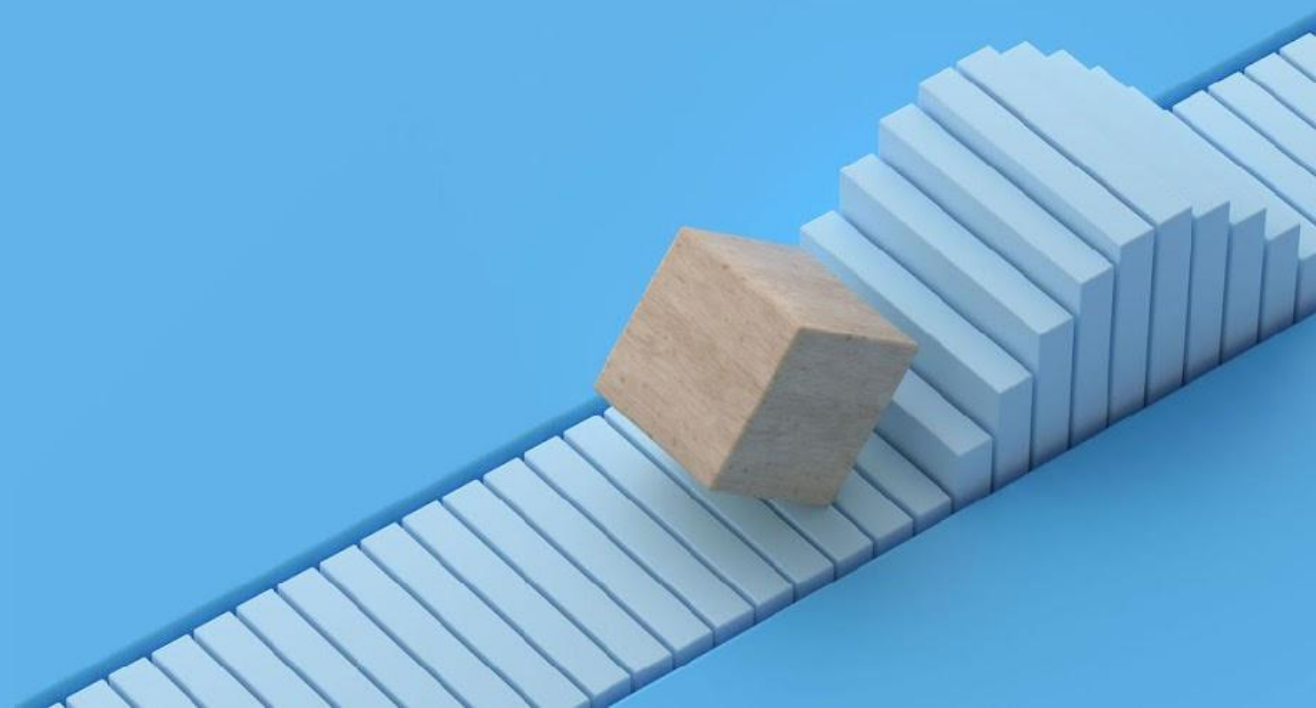
- (1) Storage infrastructure professionals, (2) Storage infrastructure managers/directors, and (3) Data center managers or operators are identified as **the primary audiences of the sustainability dashboard**

- Participants find three particularly useful metrics for their sustainability/energy reports: **Capacity Utilization, Environmental Indicators, Recommended Actions**

- Contributors appreciate actionable insights from the Recommended actions. However, some critical info is required for them to feel comfortable to take action.

Part I:
Survey
Results Deep Dive

UX Research: BlueXP Sustainability



BlueXP, Sustainability Interest
Part I: Screener Survey

UX Researcher: Stacy Wang
UX Designer: Dylan Dickey
Date: August 25, 2023

Recruiting Survey Goal

To understand who is the target market for Sustainability data and how the data can be used. In NetApp internal interviews, **we learned that Facilities is in charge of energy efficiency efforts but was not identified as a primary market for the level of detail offered in the Sustainability dashboard.** The recruiting survey was used to

(1) Determine the audiences of the dashboard

(2) Recruit for further interviews and information gathering.

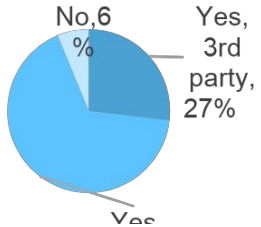
This survey was sent out to a mix of NetApp customers on a variety of UX personas. Below are the results of the survey.

Key Findings

- Two-thirds of all NetApp customers surveyed have a data center(s) owned by their employer. One quarter has data center(s) owned by a 3rd party. 6% do not have a data center that they work with.
- Energy bills associated with a data center are generally paid by the facilities department and/or IT.
- Roughly half of all participants stated that their company and they themselves are interested in energy use surrounding their data center and their storage equipment.
- While interest exists in sustainability data, company leadership rarely or only occasionally ask for this type of information from Storage Engineers / Administrators. Participants did cite that interest is increasing.

Quick Study Questions

1. Does your company have an on-premises data center?



2. Which team is responsible for the energy bills associated with your data center?

   57% Facilities **47% IT**

3. How interested is *your company in sustainability* efforts surrounding the energy use of your data centers?

   47% T2B interested (among total, N=100)

   43% T2B interested (among data center owners N=72)

   57% T2B interested (among 3rd party management N=28)

4. How interested is *your company* in sustainability efforts surrounding the energy use of your storage equipment?

   50% T2B Interested (among total N=107)

   52% T2B Interested (among data center owners N=72)

   50% T2B Interested (among 3rd party management N=28)

   28% T2B Interested (among no data center N=7)

5. How interested *are you* in sustainability efforts surrounding the energy use of your storage equipment?

   52% T2B Interested (among total N=107)

   52% T2B Interested (among data center owners N=72)

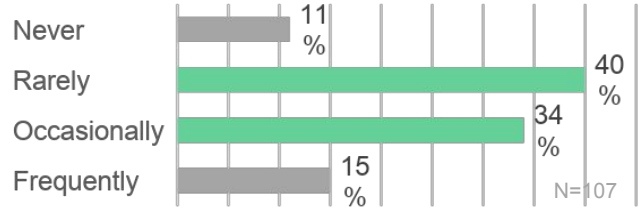
   54% T2B Interested (among 3rd party management N=28)

   43% T2B Interested (among no data center N=7)

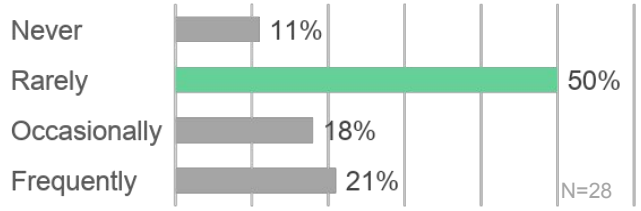
Source: UX Research Sustainability Recruiting Survey N=113

Q6 How often are you asked about sustainability efforts surrounding the energy use of your storage equipment?

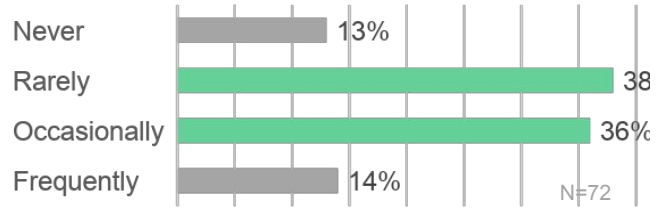
Total Respondents



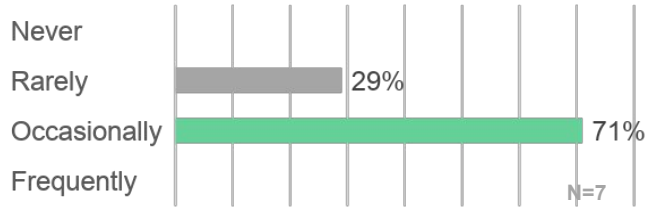
3rd Party Data Center



Data Center Owners



No Data Center *(low sample size)*



"Our company of 20,000 staff operating globally has committed to net zero by 2030. Telemetry and reporting is critical to measuring progress."

I think it's a good start, but we need to dig a little deeper into this. Previously that was not a factor regarding any actions or conclusions. It might change now :)

Q8 For each of the roles in your organization below, how interested would they be in the information presented in the sustainability assessment dashboard? (T2B)

	CEO	CFO	CTO	Facilities manager	Environmental impact specialist	**Data center manager**	**Infrastructure manager / director**	**Storage infrastructure professional**
Total	40%	39%	49%	50%	56%	61%	64%	66%
Data Center Owners	40%	44%	51%	50%	52%	63%	67%	71%
3rd Party Owned	29%	22%	37%	48%	63%	52%	55%	63%
No Data Center	86%	72%	85%	72%	72%	86%	72%	43%

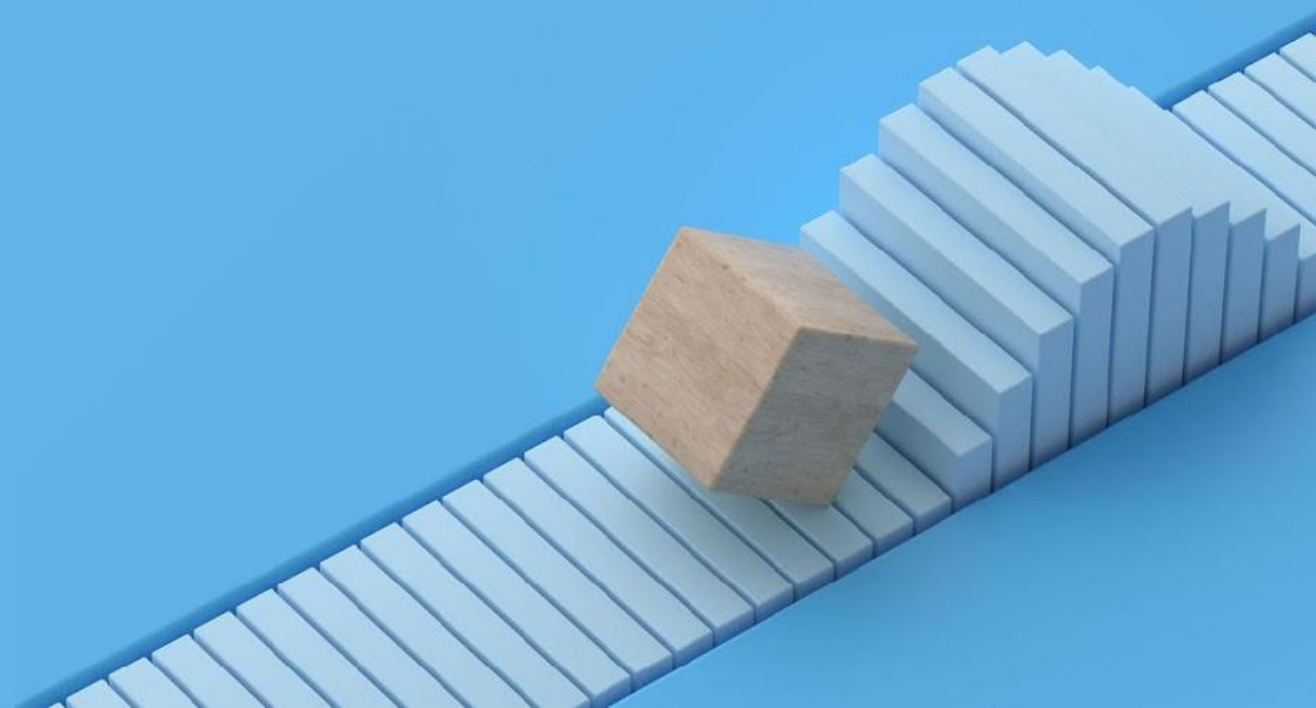
The data would be used to justify moving to more energy efficient storage platforms.

The entire storage team plus the data center manager and his team would be very interested and excited to reduce the overall power consumption

Source: UX Research Sustainability Recruiting Survey N=113

Part II:
In-depth Interview Results Deep Dive

UX Research: BlueXP Sustainability



1-1 Types of Sustainability-Related Questions
1-2 Company Goals

Area	Company Goal	
Reducing Footprint	**Efficiency and Reduction**	• Get rid of older systems • Optimize data center operations
Power and Cooling	**Long-term Purchase Planning**	• Reduce energy consumption • Reduce heat generation
CO2 Emissions	**Public Commitment to Sustainability**	Although not a primary concern as of now, Some users anticipate needing data on CO2 emissions in the future

2.1 Who Typically Asks Sustainability-Related Questions

Role	Responsibility
Facilities	• Managing resources effectively • Reducing the physical footprint of data centers.
IT	• Resource optimization • New system purchases or upgrades decisions
CEO/ Executive	• Initiating and pushing for sustainability effort • Decision making
CES (Chief of Environment and Sustainability)	• Managing resources like power and cooling • Work with the data center team to ensure the facilities meet the necessary requirements for sustainable operations

2-2 Who is Responsible for Paying Utility Bills

Role	Responsibility
IT	• These entities are normally the owners of the budget surrounding utility • They collaborate closely but often are two separate organizations
Facilities	
Finance Team/CFO	Whilst finance is responsible for physically paying the bills, they are not always the owners of this budget.
Chief Sustainability Officer (CISO)	• One participant shared that CISO makes the final decisions around sustainability, which could include aspects related to utility usage and costs. • However, this may not be a common position in many companies.

2.3 Reasons for Asking Sustainability-Related Questions

Role	Responsibility
Cost Saving	**This is a priority for many organizations.** • Reducing energy usage • Optimizing resources • Managing the physical footprint
Energy Usage Reduction	• Environmental concerns • Regulatory compliance • A broader initiative towards sustainability
Capacity Management	Reducing the overall capacity that they're using, which in turn would reduce the energy footprint,

3.1 Do you see your role changing to accommodate these types of questions?

Yes, participants indicated that they foresee their roles changing to accommodate sustainability-related questions

Additional Responsibilities	To a smaller degree of change in their role, particularly in increasing efficiency.
Potential Career Shifts	• One customer is expecting a more significant career shift, potentially requiring new training or certifications. • This suggests that **sustainability is becoming a more specialized** and recognized area within the field.

3.2 Who is Responsible for Providing Sustainability Report

Role	Responsibility
Individual	Those in roles focused on data center efficiency see themselves as the primary person responsible for providing sustainability metrics to stakeholders.
Collaboration between **Storage Teams** and **Architects**	Storage teams often pull the necessary data and provide it to architects (who might not have direct access to sustainability data), who consider sustainability as a goal in their designs.
CoLo Providers	In some cases, CoLo (colocation) providers play a key role in providing monthly reports on capacity and power usage *Applicable to those who have 3rd party managed data centers

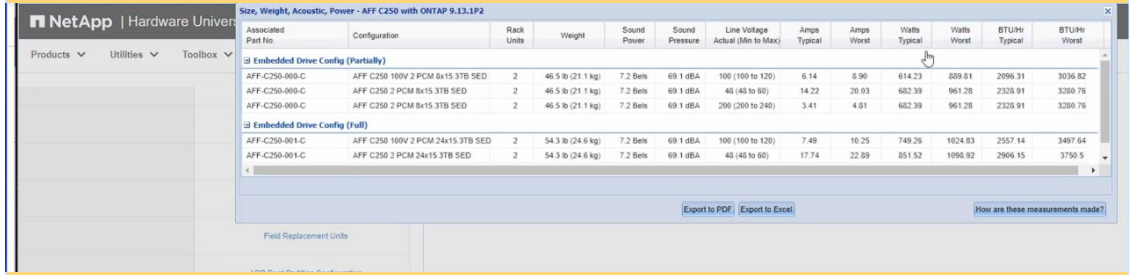
3.3 Access to the Dashboard

- Currently, it appears that many in management roles do not have direct access to the dashboard.
  - They rely on specific individuals (like those in IT or Facilities Management) to collect and provide the necessary information.
- There are concerns about granting full access to non-storage professionals due to system capabilities
  - There is some interest in having **Role-Based Access Control (RBAC)**, where individuals can be granted view-only access to certain parts of the dashboard.

4.1 Current Tools for Accessing Energy Use Information

Tools that were mentioned

- **NetApp Hardware Universe**



- **NetApp Harvest**

- Hitachi
- Galileo Suite
- Fusion
- Internal Tool

4.2 Comparison with BlueXP Dashboard

- Overall, participant like that the BlueXP dashboard provides a higher level of detail compared to their current tools.

"Hitachi and Galileo doesn't provide as much detail as BlueXP"

"Compared to Hitachi...Hitachi doesn't provide these details. It's just a regular storage management tool."

- Hardware Universe is vendor-specific and doesn't provide a holistic view across different storage environments.
  - Users expressed a desire for the BlueXP dashboard to provide details for other vendors' storage environments.

Theme 5 Navigate to the dashboard from the home page

5.1 Information Architecture (IA)

- Overall, it didn’t take them too long to find the baseboard.
- However, many of them had to go through some backtracking before they landed on the dashboard. Based on where they navigated, a few common wrong paths:
  1. Governance --> Economic efficiency
  2. Health
  3. My estate

  In summary, many called out that **Governance is not the right place** and there were gaps between their mental model and our current information architecture (IA)

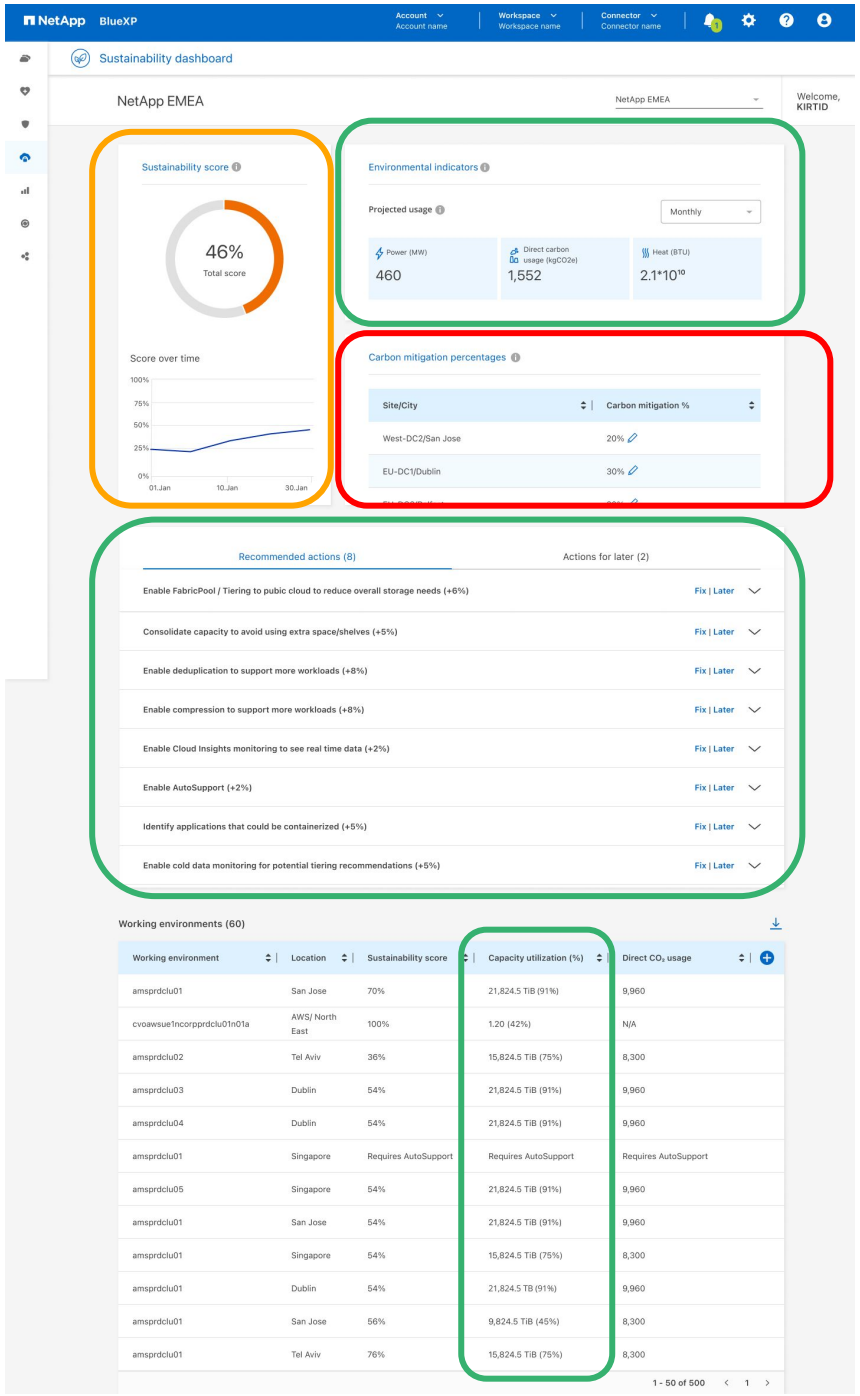
Theme 6 Main objectives and tasks

6.1 Main Objectives or Tasks with the Dashboard

- Task 1: Gather information to identify the areas that could be improved
  - The most common areas are Power/cooling efficiency and recommended actions
- Task 2: Inspect an outage due to overheating
  - This suggests a need for real-time or near-real-time monitoring capabilities.
- Task 3: Help them understand the impact of changes in their data centers, such as installing all-flash arrays.
- Task 4: Use the dashboard to compare the power consumption of different systems.

6.2 The important Metrics for their Report

Capacity Utilization	How effectively they are using their current capacity
Environmental Indicators	• Power and Heat • Energy (power) consumption • CO2 Emissions
Recommended Actions	Help them identify where they can make improvements
Sustainability Score	It could be helpful, but further explanation and benchmarking data are needed for it to be useful
Carbon Mitigation	Many participants currently do not use the carbon mitigation percentages, but it is getting attraction gradually

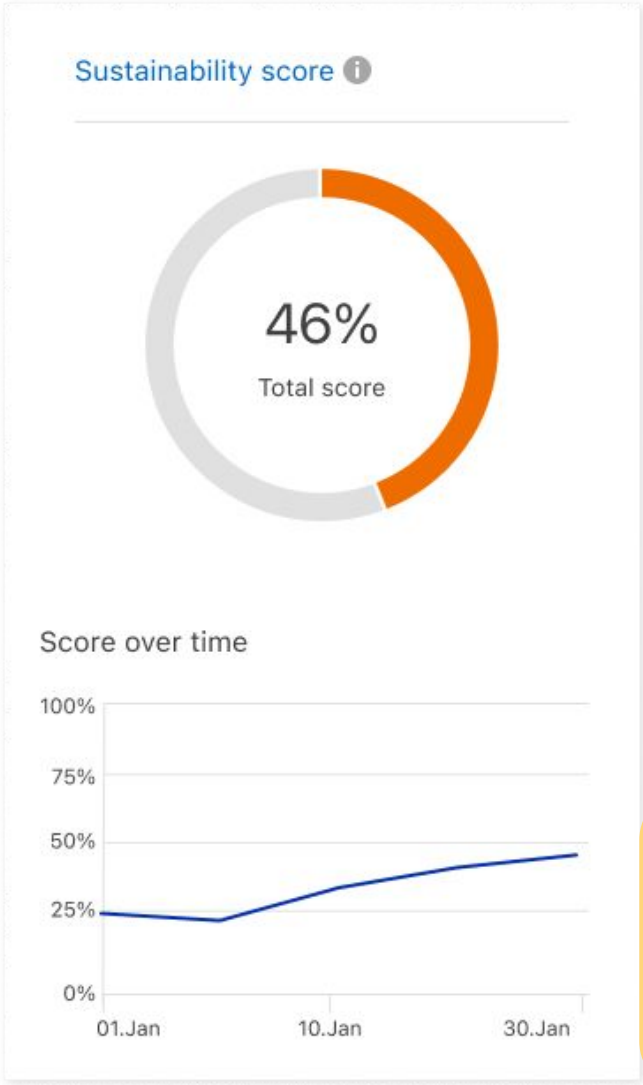


6.3 Suggestions for the dashboard in general

Some suggestions mentioned by participants are:

- **Benchmarking data** is needed to help our customers understand what constitutes "good" and "bad" numbers for certain metrics
- **Information for other vendors' storage equipment**
  - This can help them make more effective comparisons across vendors.
- **Global view**, the ability to select multiple companies/customers in the top-right dropdown.
- The ability to **download reports** and access a history of older reports.

7.1 Sustainability Score



Sustainability Score

Many participants were confused about how the sustainability score is calculated

There was a common understanding that reaching 100% might not be a realistic goal

More information on **the calculation of the sustainability score** is needed for it to be useful for our customers.

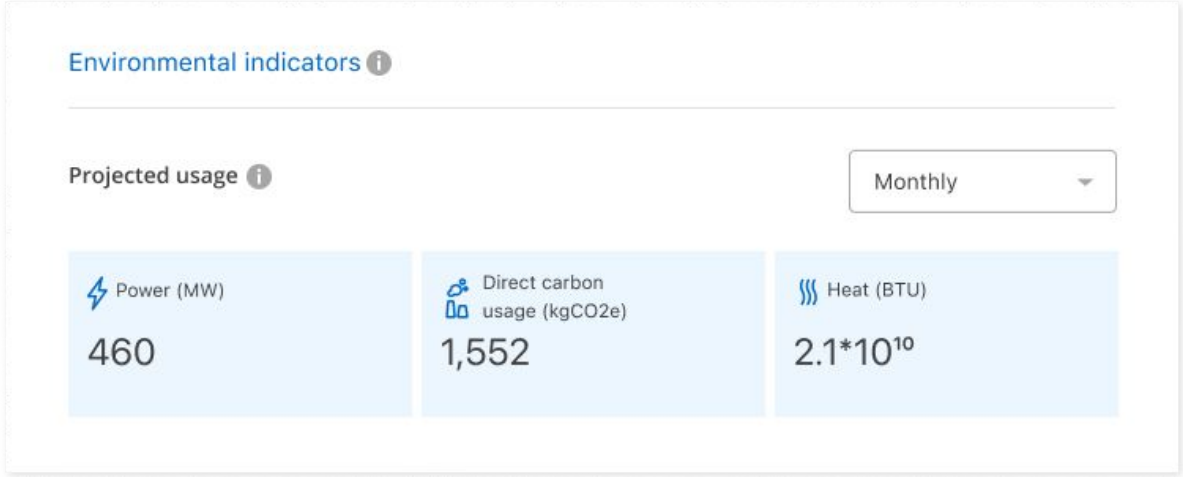
Users would like the sustainability score to be interactive, allowing them to click on it to view the data behind the score

The tooltip didn't provide sufficient explanation

Score over time

Users would like the ability to adjust the time period for the "score over time" chart associated with the score.

7.2 Environmental indicators



In general, users would like the environmental indicators to be more contextualized

Showing a **graph** of how these indicators are trending over time with **data timestamped**

Input and output temperature data for each array

Contributors find environmental indicators useful

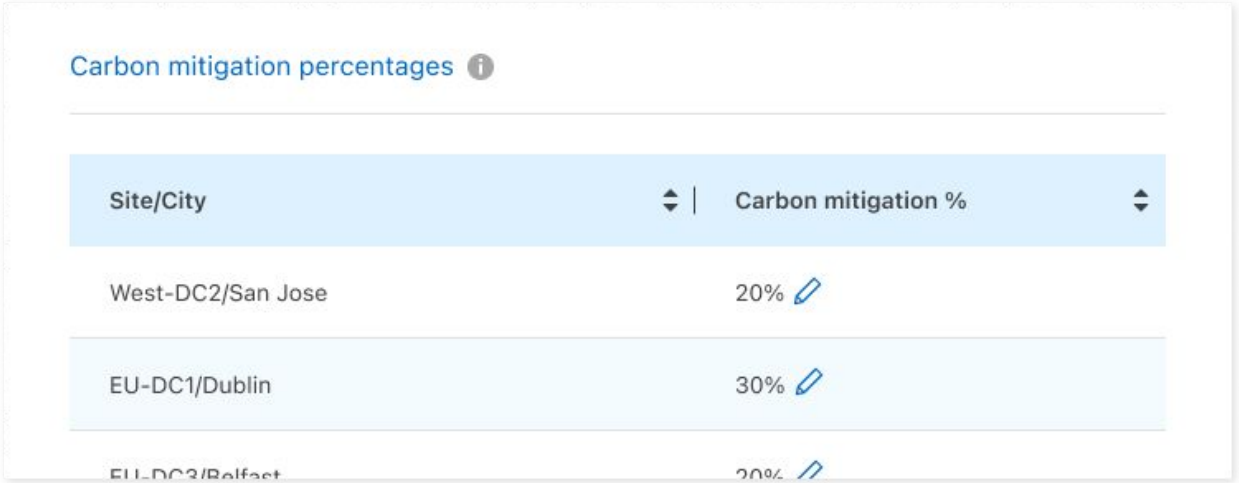
Power usage and **heat generation** are key environmental indicators that users are interested in.

Site-specific views in the environmental indicators

The ability to compare different sites (e.g., US versus Europe)

To understand the specific power draw for each location

7.3 Carbon mitigation percentages



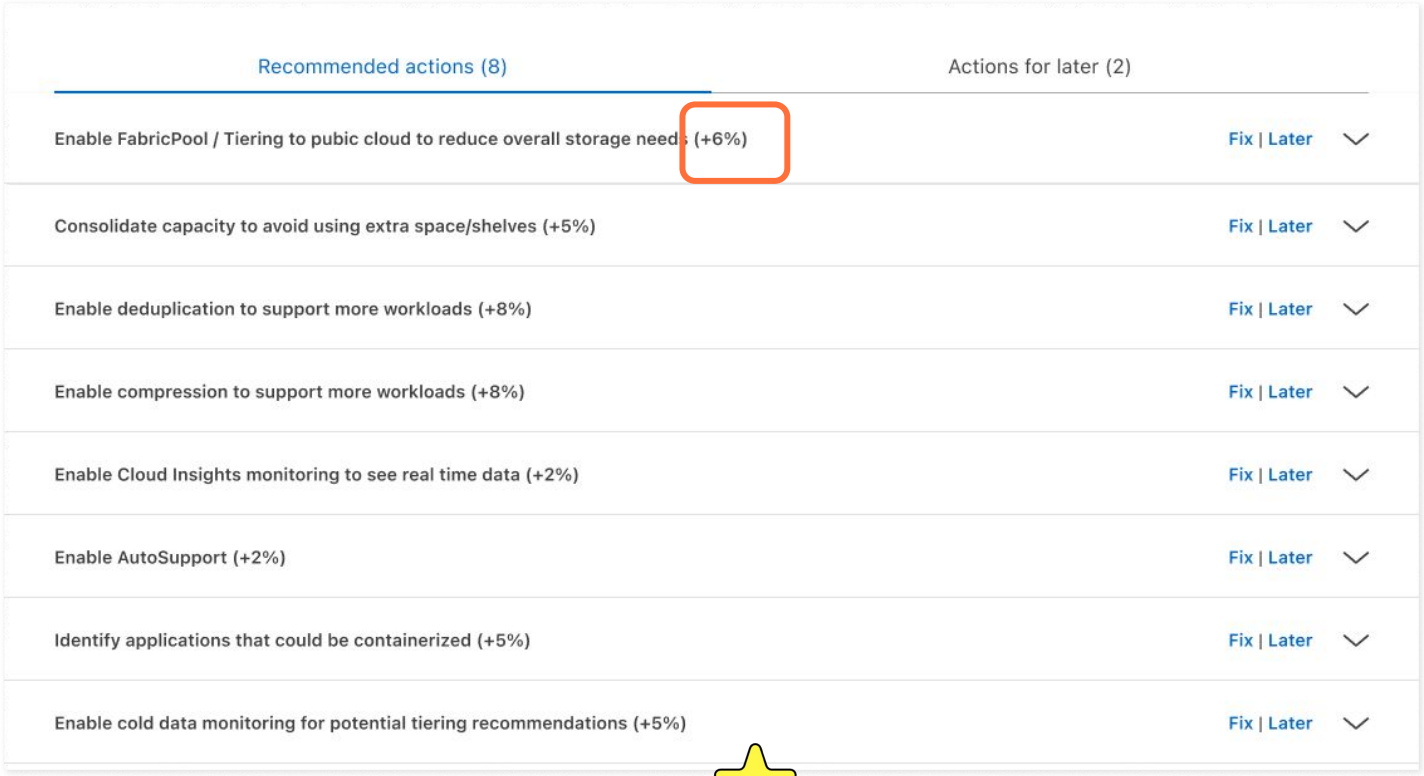
Users interpret the carbon mitigation percentages as a measure of how much the carbon emissions are being addressed at each location, taking into account emissions, savings, and carbon credits

With that in mind, they would like to see carbon mitigation percentages to be broken down by sites or regions

Many participants currently do not use the carbon mitigation percentages, focusing more on power and heating

However, some users anticipate needing data on CO2 emissions in the future

7.4 Recommended actions



Users need further info about what the percentage improvements (+6) refer to

The potential benefits and drawbacks of implementing the recommended actions

The level of effort required to implement the recommended actions

More specific recommendations, down to the volume level

Contributors appreciate actionable insights from the dashboard. This helps them identify where they can make improvements

However, some also expressed hesitation about implementing the recommended actions without fully understanding their impact

7.5 Working environments

Working environments (60)

Working environment	Location	Sustainability score	Capacity utilization (%)	Direct CO_2 usage
amsprdclu01	San Jose	70%	21,824.5 TiB (91%)	9,960
cvoawsue1ncorpprdclu01n01a	AWS/ North East	100%	1.20 (42%)	N/A
amsprdclu02	Tel Aviv	36%	15,824.5 TiB (75%)	8,300
amsprdclu03	Dublin	54%	21,824.5 TiB (91%)	9,960
amsprdclu04	Dublin	54%	21,824.5 TiB (91%)	9,960
amsprdclu01	Singapore	Requires AutoSupport	Requires AutoSupport	Requires AutoSupport
amsprdclu05	Singapore	54%	21,824.5 TiB (91%)	9,960
amsprdclu01	San Jose	54%	21,824.5 TiB (91%)	9,960
amsprdclu01	Singapore	54%	15,824.5 TiB (75%)	8,300
amsprdclu01	Dublin	54%	21,824.5 TB (91%)	9,960
amsprdclu01	San Jose	56%	9,824.5 TiB (45%)	8,300
amsprdclu01	Tel Aviv	76%	15,824.5 TiB (75%)	8,300

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Participants are particularly interested in the **Capacity Utilization** metric

They use this information to make decisions about migrating to different arrays and decommissioning existing ones

Users appreciate the **real-time monitoring** option and believe it would be of interest to management

They found the column selector feature “+” useful for customizing the table to display the metrics they are interested in and didn't seem to have a usability issue with the **"add columns" button** and **the left/right scrolling.**

Theme 8 UM/UX

Usability Metrics for User Experience T2B

80%

Meets Expectations

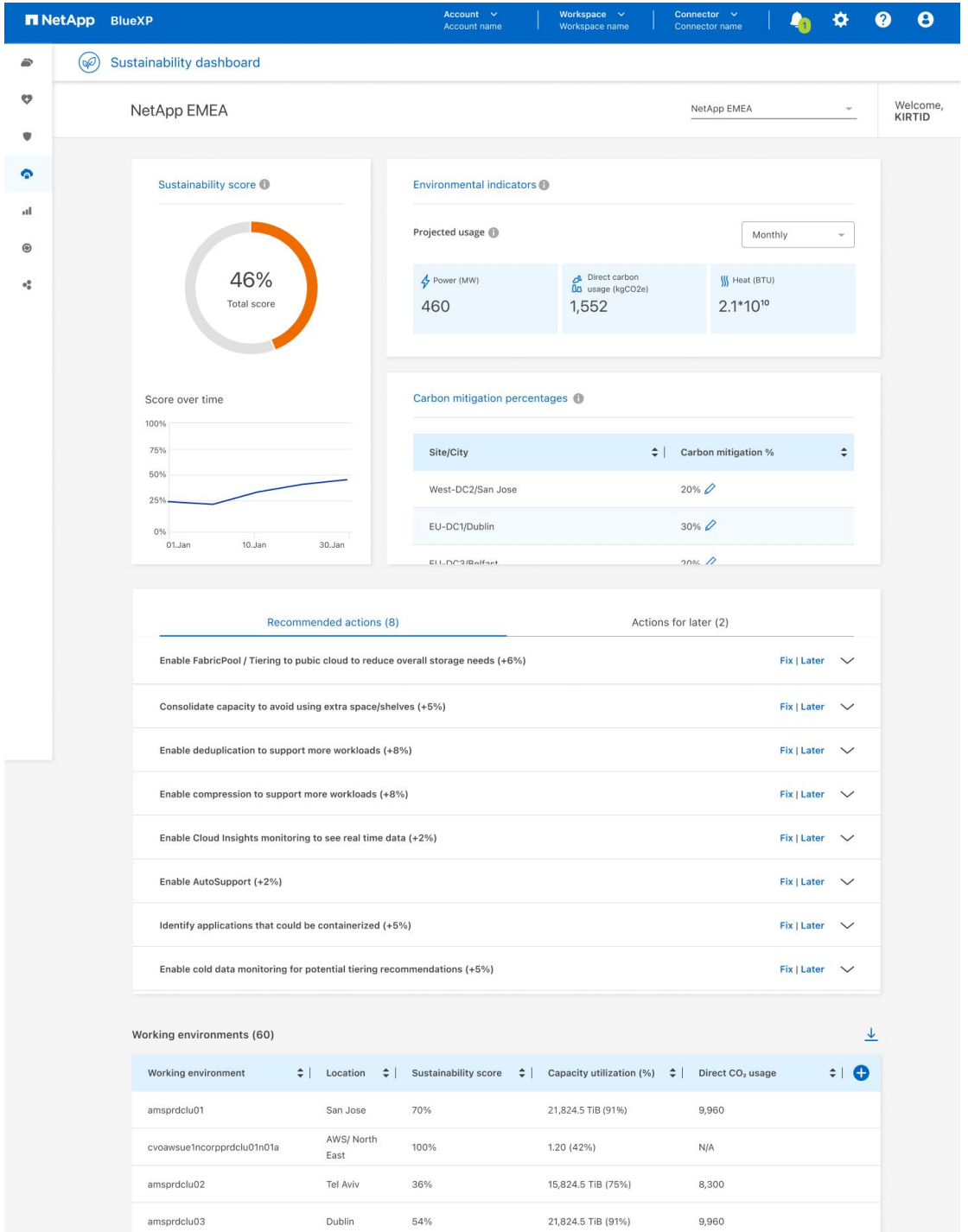
Would like to see more granular detail on things like recommended actions. Like recommendations down to the volume level

100%

Easy to Use

100%

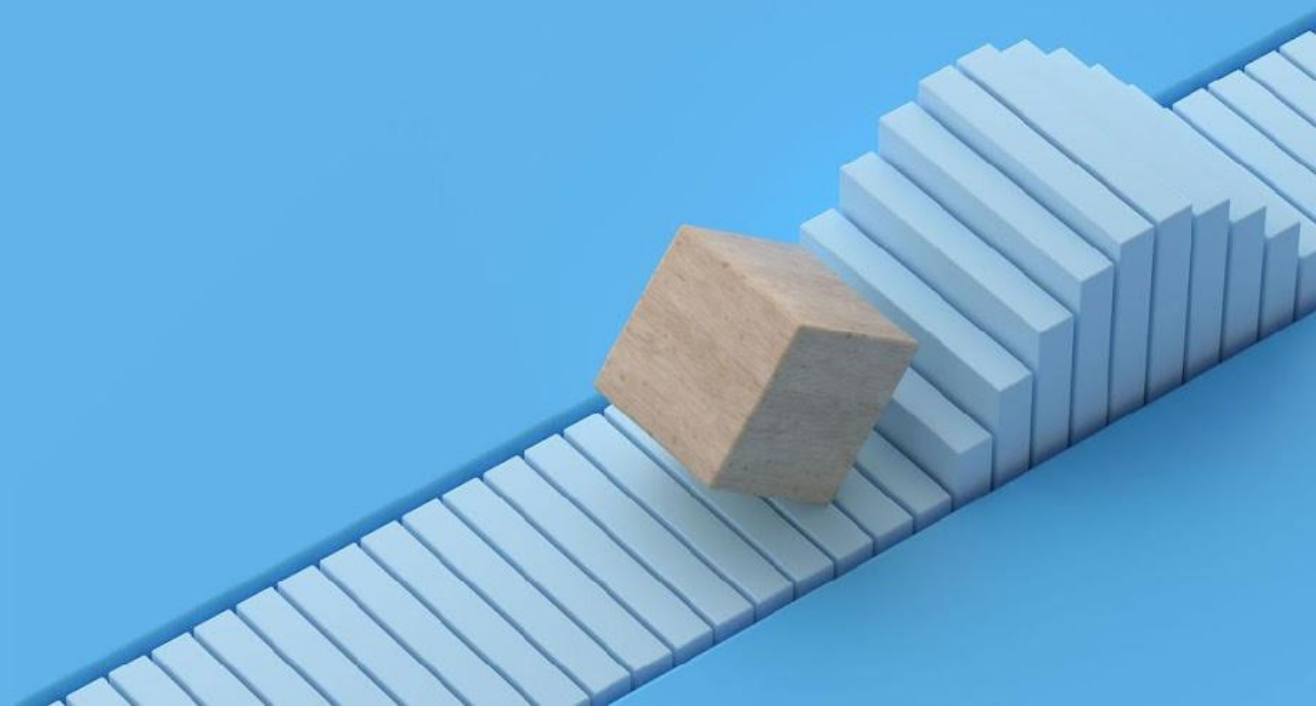
Customer Satisfaction



Thank you

Appendix

UX Research: Sustainability usability study



Interview Recording

Interview Date	Participant's Company	Zoom Recordings
9/19/23 (Tue)	National Institutes of Health (NIH) Customer	Link Passcode: UnJq2$?a
9/20/23 (Wed)	Storage Hawk Partner/Reseller	Link Passcode: 1BzHpxu=
9/20/23 (Wed)	Xylem Inc Customer	Link Passcode: 5db^w$JU
9/21/23 (Thu)	HCL Customer	Link Passcode: R%$5s!UM
9/21/23 (Thu)	Micron Customer	Link Passcode: &aH46mx5