

To communicate data effectively you need to understand your audience

Mary Ellen Gordon

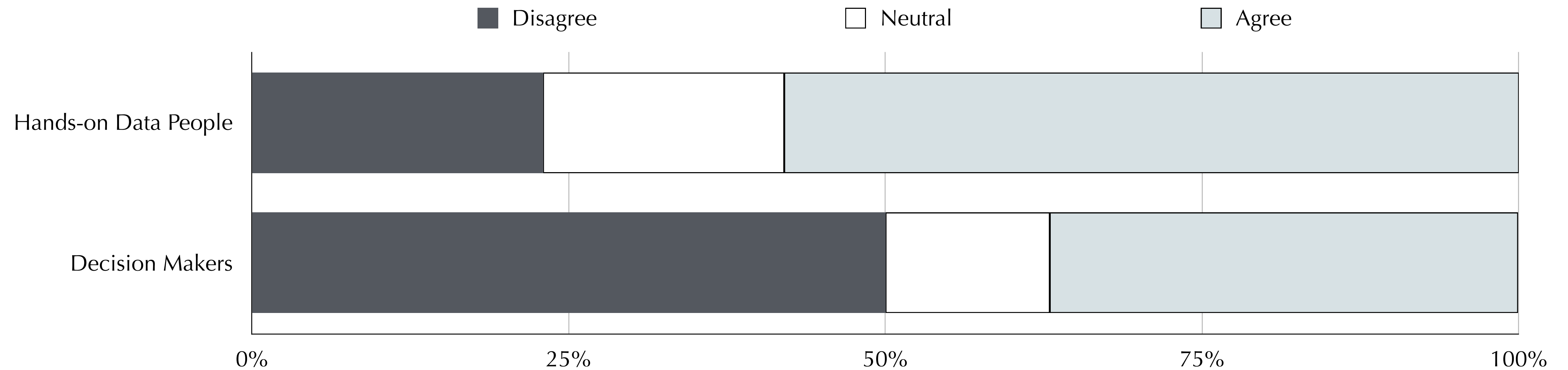
Guest Lecture for SWEN 422

April 2, 2025

Why is this important?

Because a lot of decision makers don't agree that in their organisation:

“Data insights are presented in a usable way which makes it easy to make decisions”*



n = 97 hands on data people, 43 decision makers

Why is this important?

Because New Zealand now has a Plain Language Act

(See: <https://overcast.fm/+S0FWWhpGc> and also
<https://www.legislation.govt.nz/act/public/2022/0054/latest/DLM4357602.html#LMS701263>)

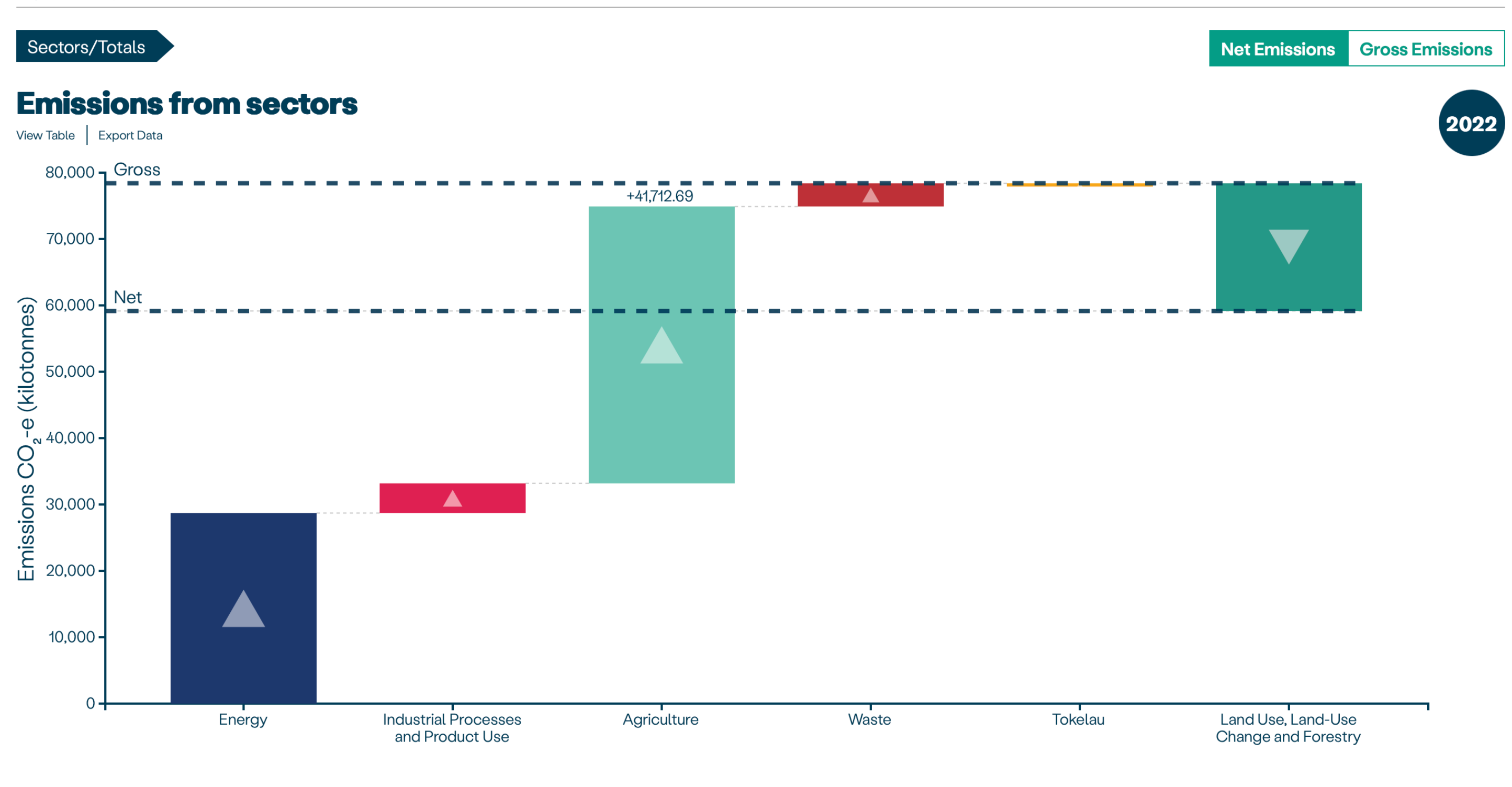
The focus of the Act is on writing, which is obviously relevant to reports describing analytical results, but a lot of the same principles should apply to other forms of data communication too.

What does understanding your audience mean?

Who are they?

I will be using this visualisation from the Ministry for the environment as my example. It is available [here](#).

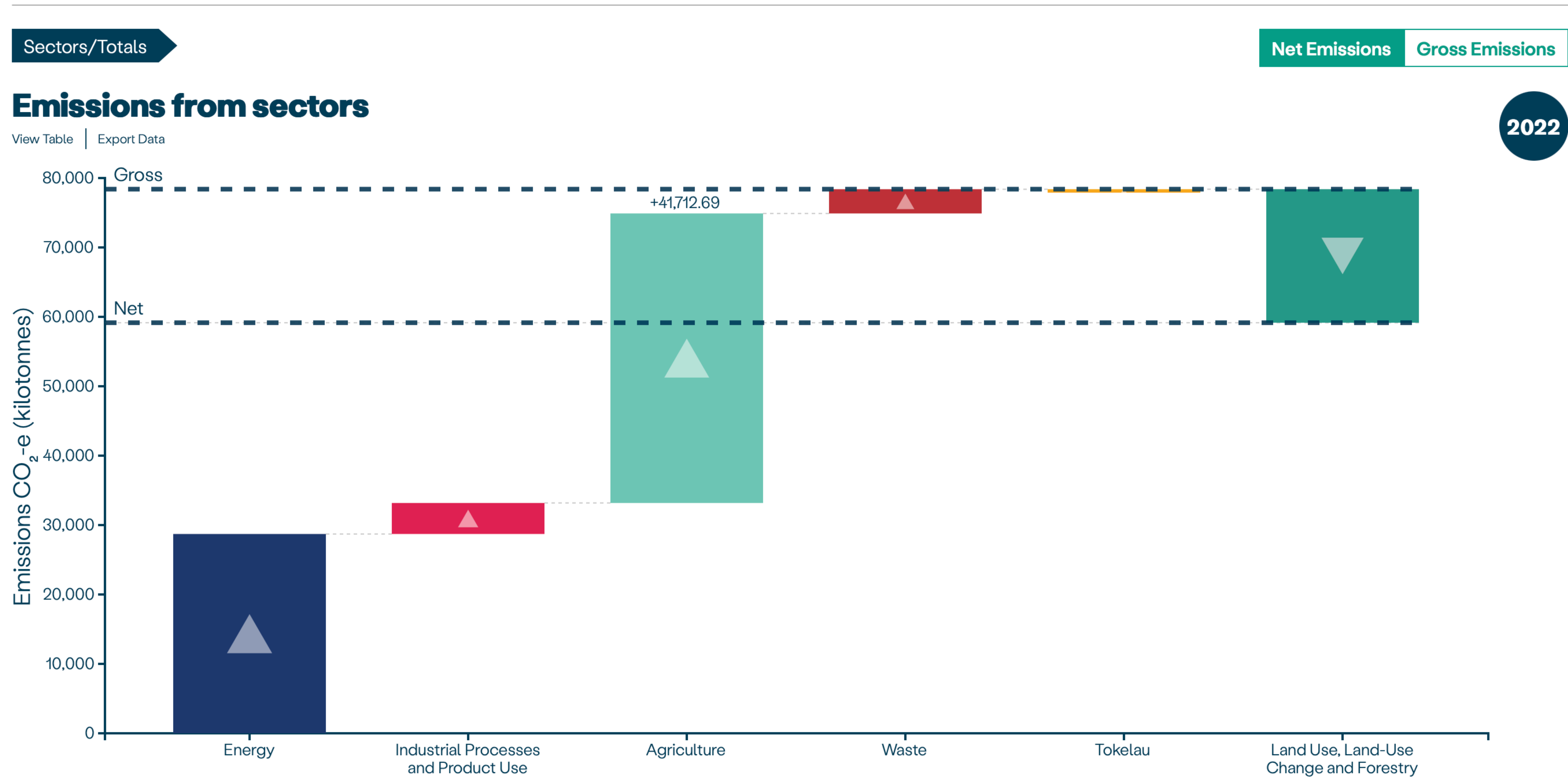
Who do you think the target audience for this visualisation is?



Conceptual knowledge about the domain

- How deep an understanding do members of your audience have about the domain? This will affect how much explanation is needed.
- What assumptions do members of your audience make about the domain? Those often drive gut-level decision-making.
- How well do *you* understand the domain? Domain knowledge can help you focus on the most important information and spot problems in the data. One way data people can be more impactful is to enhance their domain expertise.
- Lack of such expertise can lead to mistakes, which can result in bad decisions and loss of credibility for the data people involved. For example, whatever you think of DOGE, they are making many large and significant errors due to lack of conceptual knowledge about the domain. (e.g., [1](#), [2](#), [3](#)).

How much conceptual knowledge do you believe the audience for this has about GG emissions?



Data-related knowledge

- How much general knowledge does your audience have about statistics / data / analytics? That has a big influence on the best way to present results.
 - ▶ How much explanatory information to provide.
 - ▶ How much statistical detail to include.
- How much knowledge do people in your audience have about domain-specific data?
 - ▶ Are they aware of what data does and does not exist?
 - ▶ Do they know how particular data points are generated?
 - ▶ Do they understand the limitations of the data?

How much data-related knowledge do you believe the audience for this has about GG emissions?

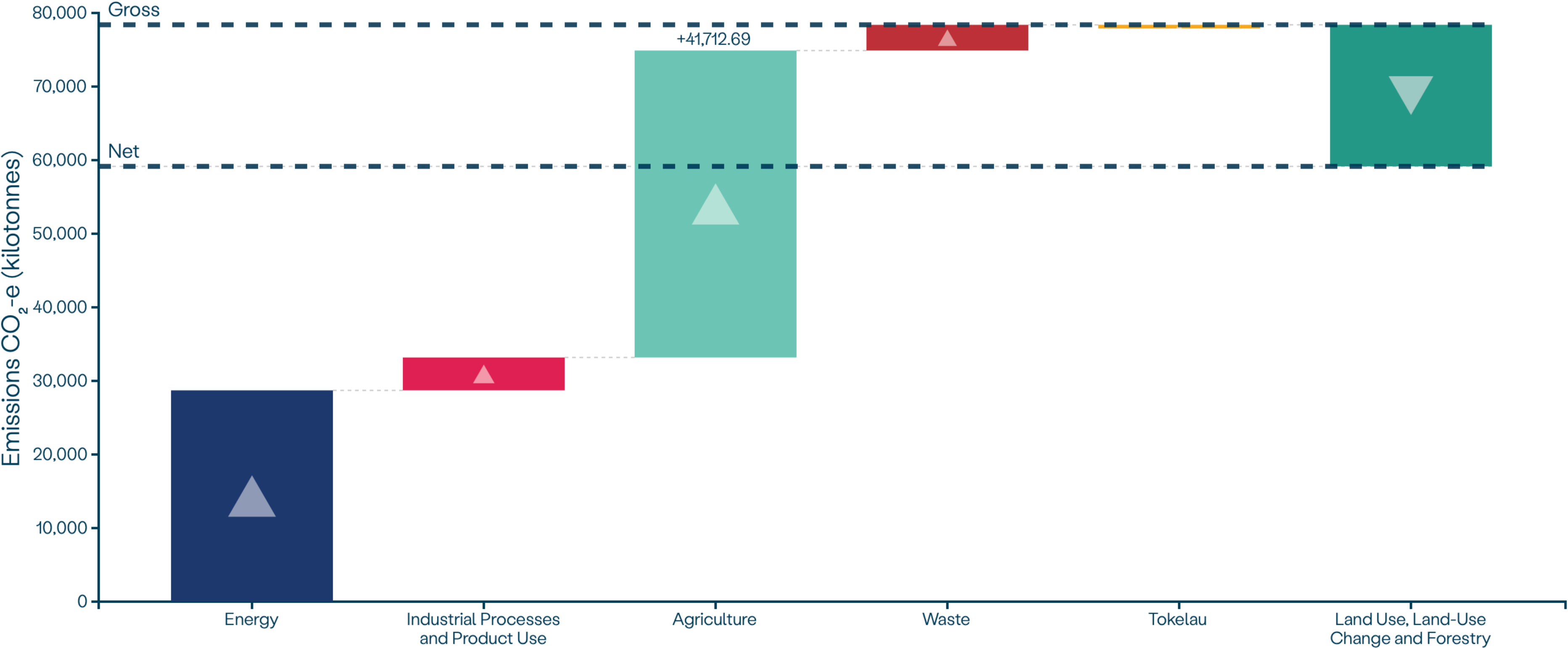
Sectors/Totals

Net Emissions | Gross Emissions

Emissions from sectors

View Table | Export Data

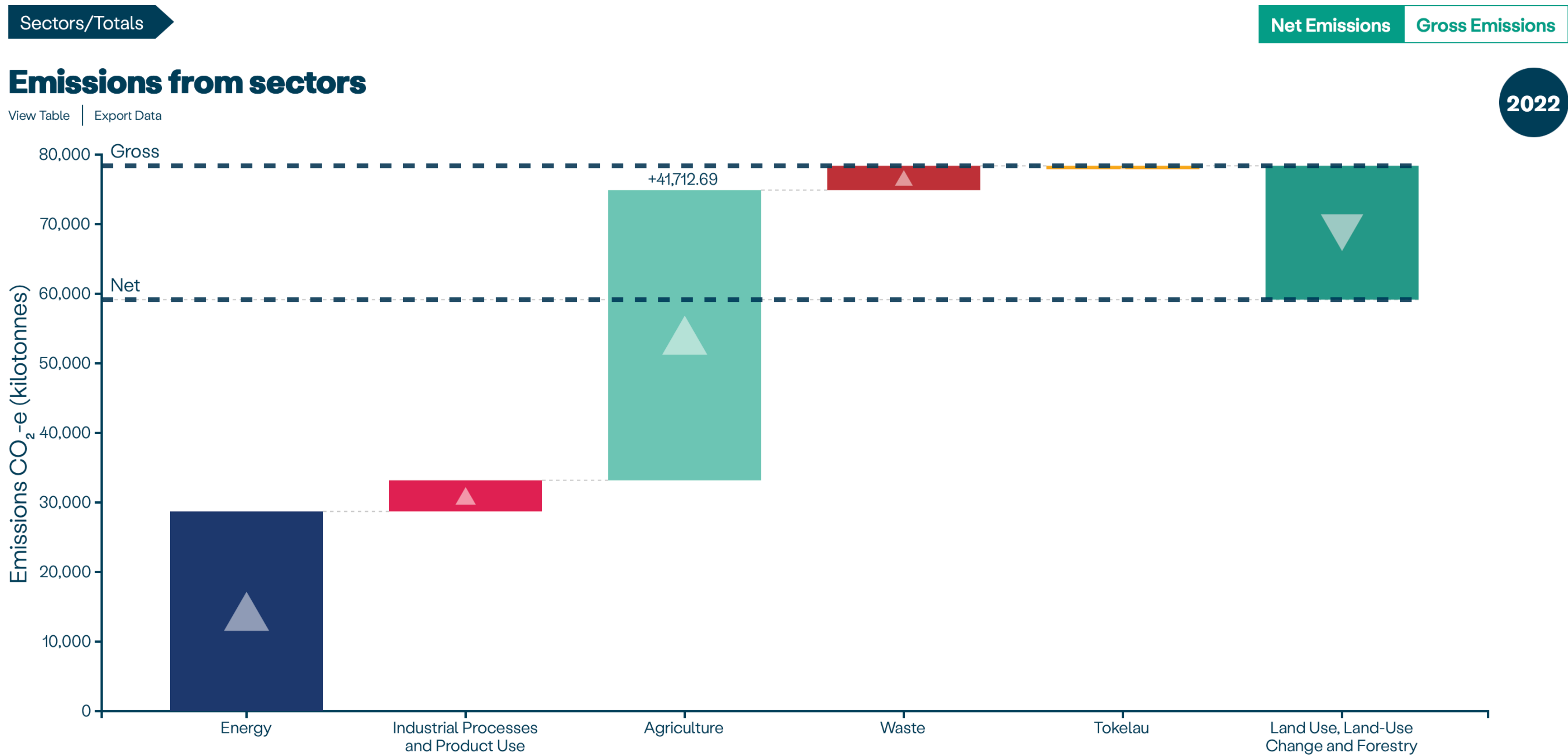
2022



What does your audience want?

- Have they requested specific information?
 - ▶ Why do they want it?
 - ▶ How will they use it?
- What types of strategic, tactical and operational decisions do they need to make? What data could help inform those?
- How have they used data you provided in the past? Try to get copies of slides, reports or other materials they produce that draw on information you have provided. Those can provide good clues about what is important to them.

What do you believe the audience for this wants?



How does understanding our audience help us create impactful data communication?

- What we present needs to be true (i.e., statistically and methodologically valid), but also...
 - ▶ Relevant to the target audience.
 - ▶ Presented in a way that is consistent with their level of domain knowledge.
 - ▶ Presented in a way that is consistent with their level of general and domain-specific data-related knowledge.
 - ▶ Structured in a way that makes it easy for them to follow and find the information they want or need easily.
 - ▶ Structured in a way that gives greatest emphasis to the things that are most important to the target audience.

If possible, results reported should be also be presented in a way that highlights what's interesting to the target audience

- Applying the ideas of Davis (1971)* to results of applied data analysis:
 - ▶ **Interesting results are those that deny some assumption(s) of the audience.**
 - ▶ Results that just affirm assumptions of the audience will be perceived as obvious.
 - ▶ Results that don't speak to the assumptions of the audience will be perceived as irrelevant.
 - ▶ Results that deny all of the audience's assumptions will be perceived as absurd.
 - ▶ **This is why understand the assumptions of your target audience and developing your own domain knowledge are important.**

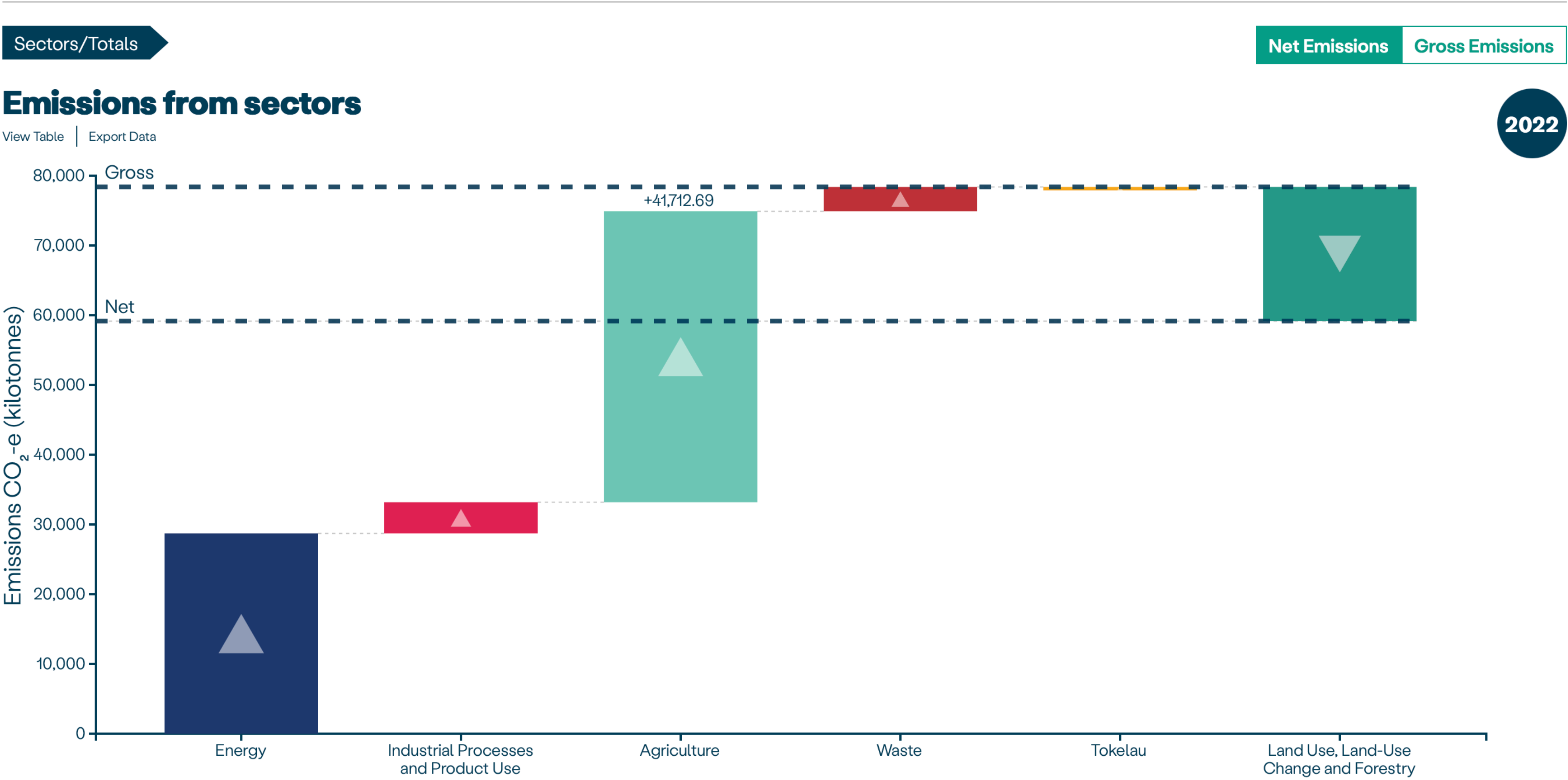
That's interesting propositions*

1a: What seems to be a disorganised (unstructured) phenomenon is, in reality, an organised (structured) phenomenon.	1b: What seems to be an organised (structured) phenomenon is, in reality, a disorganised (unstructured) phenomenon.
2a: What seem to be assorted, heterogeneous, phenomena are in reality composed of a single element.	2b: What seems to be a single phenomenon is in reality composed of assorted, heterogeneous elements.
3a: What seems to be an individual phenomenon is in reality a holistic phenomenon.	3b: What seems to be an holistic phenomenon is in reality an individual phenomenon.
4a: What seems to be a local phenomenon is, in reality, a general phenomenon.	4a: What seems to be a general phenomenon is, in reality, a local phenomenon.
5a: What seems to be a stable and unchanging phenomenon is in reality an unstable and changing phenomenon.	5b: What seems to be an unstable and changing phenomenon is in reality a stable and unchanging phenomenon.
6a: What seems to be a phenomenon that functions ineffectively as a means for the attainment of an end is in reality a phenomenon that functions effectively.	6b: What seems to be a phenomenon that functions effectively as a means for the attainment of an end is in reality a phenomenon that functions ineffectively.

That's interesting propositions*

7a: What seems to be a bad phenomenon is in reality a good phenomenon.	7b: What seems to be a good phenomenon is in reality a bad phenomenon.
8a: What seem to be unrelated (independent) phenomena are in reality correlated (interdependent) phenomena.	8b: What seem to be related (interdependent) phenomena are in reality uncorrelated (independent) phenomena.
9a: What seems to be phenomena which can exist together are in reality phenomena which cannot exist together.	9b: What seems to be phenomena which cannot exist together are in reality phenomena which can exist together.
10a: What seems to be a positive co-variation between phenomena is in reality a negative co-variation between phenomena.	10b: What seems to be a negative co-variation between phenomena is in reality a positive co-variation between phenomena.
11a: What seems to be similar (nearly identical) phenomena are in reality opposite phenomena.	11b: What seems to be opposite phenomena are in reality similar (nearly identical) phenomena.
12a: What seems to be the independent phenomenon (variable) in a causal relation is in reality the dependent phenomenon (variable).	12b: What seems to be the dependent phenomenon (variable) in a causal relation is in reality the independent phenomenon (variable).

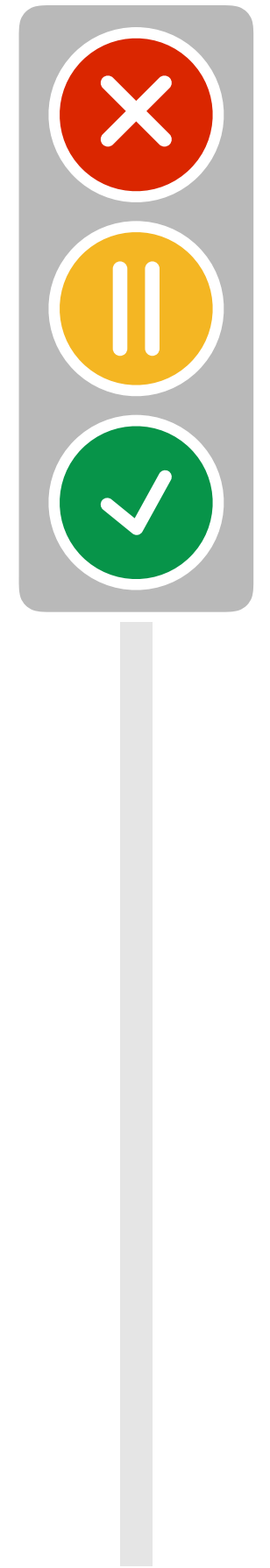
How might we make this type of information interesting for the audience we identified?



Understanding your audience well can also help you figure out how to apply some general data visualisation principles

Use of colour

- Do not automatically accept your software's default colour choices!
- Instead, think about:
 - ▶ Organisational requirements and standards.
 - ▶ Natural associations people have with different colours.
 - ▶ Ensuring the information being presented is accessible to people with visual impairments. This may include using symbols or textures as well as colour and / or using greyscale instead of colours.

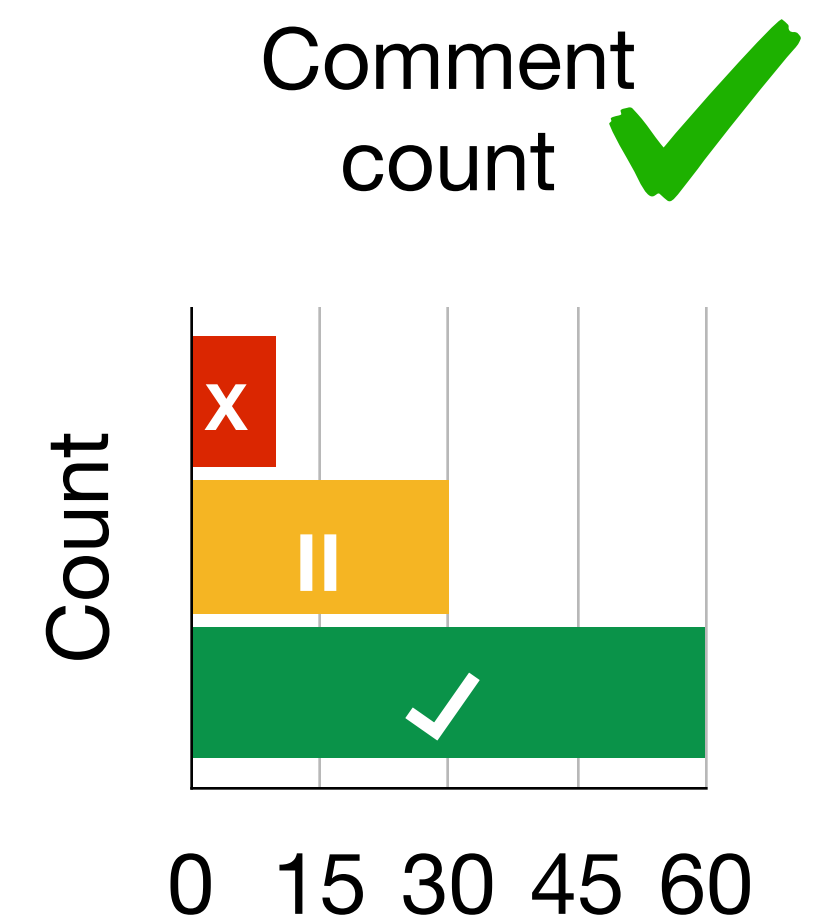
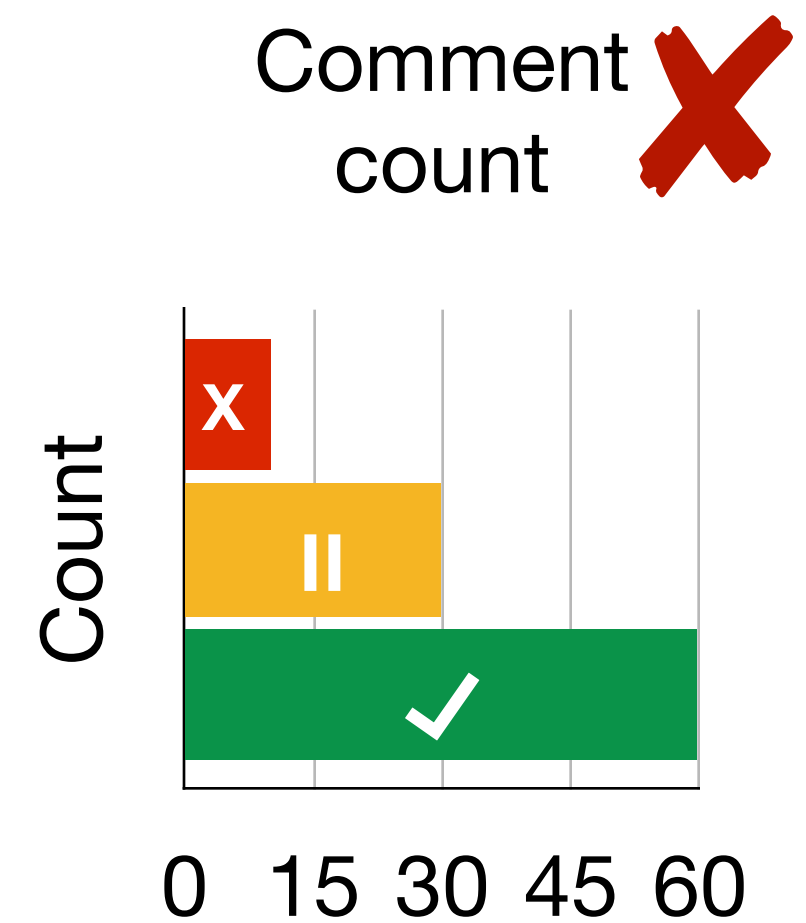
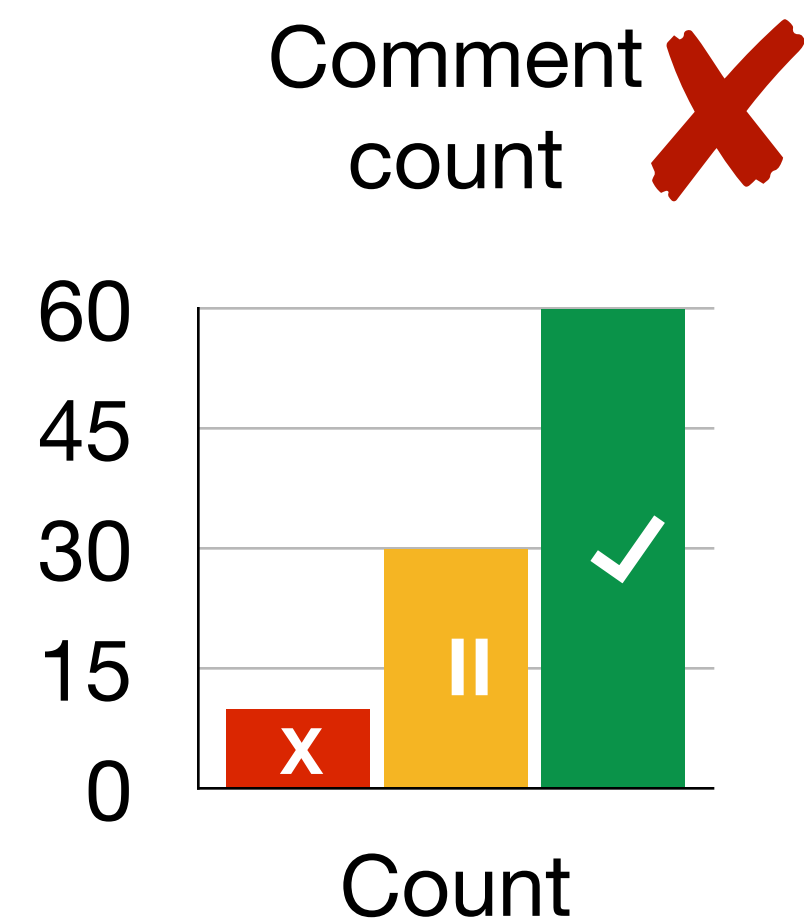
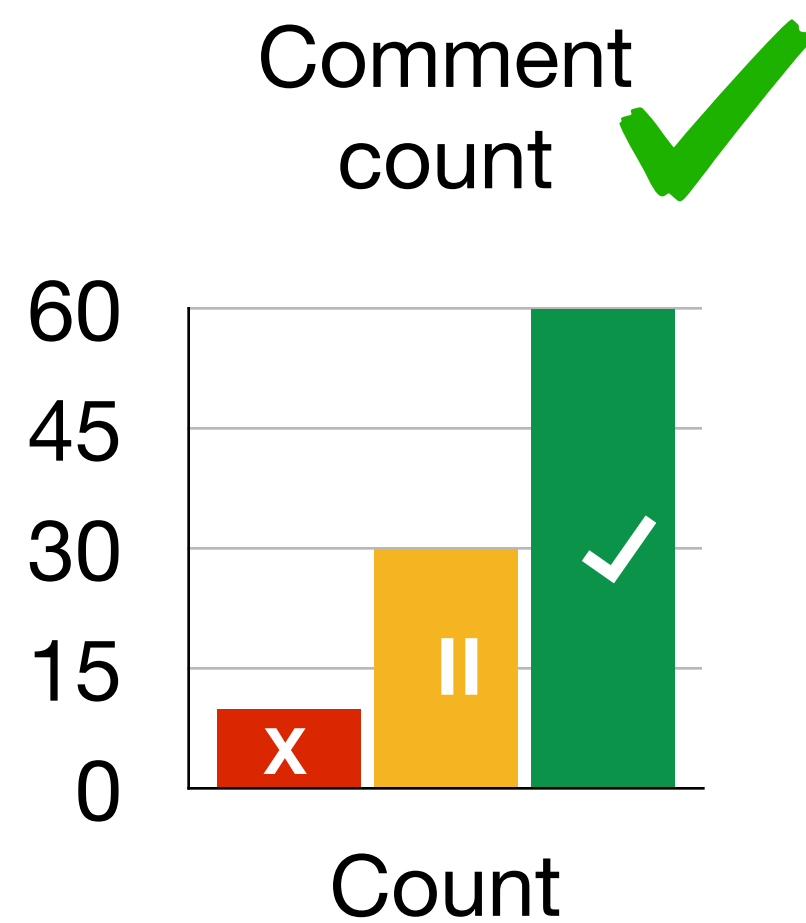


Use of order

- Do not automatically accept your software's default order!
- Think about what order is most appropriate given the audience and objective.
- Order options include:
 - ▶ Highest to lowest or lowest to highest value.
 - ▶ Highest to lowest or lowest to highest difference (between groups, time periods, etc.)
 - ▶ Alphabetical.
 - ▶ Chronological.
 - ▶ Geographical.
 - ▶ Putting data for a particular group first, and then having other groups follow based on one of the previously described orders.

Labelling and legends

- Label everything (axes, data series, groups, the units that apply to particular numbers, etc.)
- Include a legend if appropriate.
- When using a legend, follow the orientation of the chart.



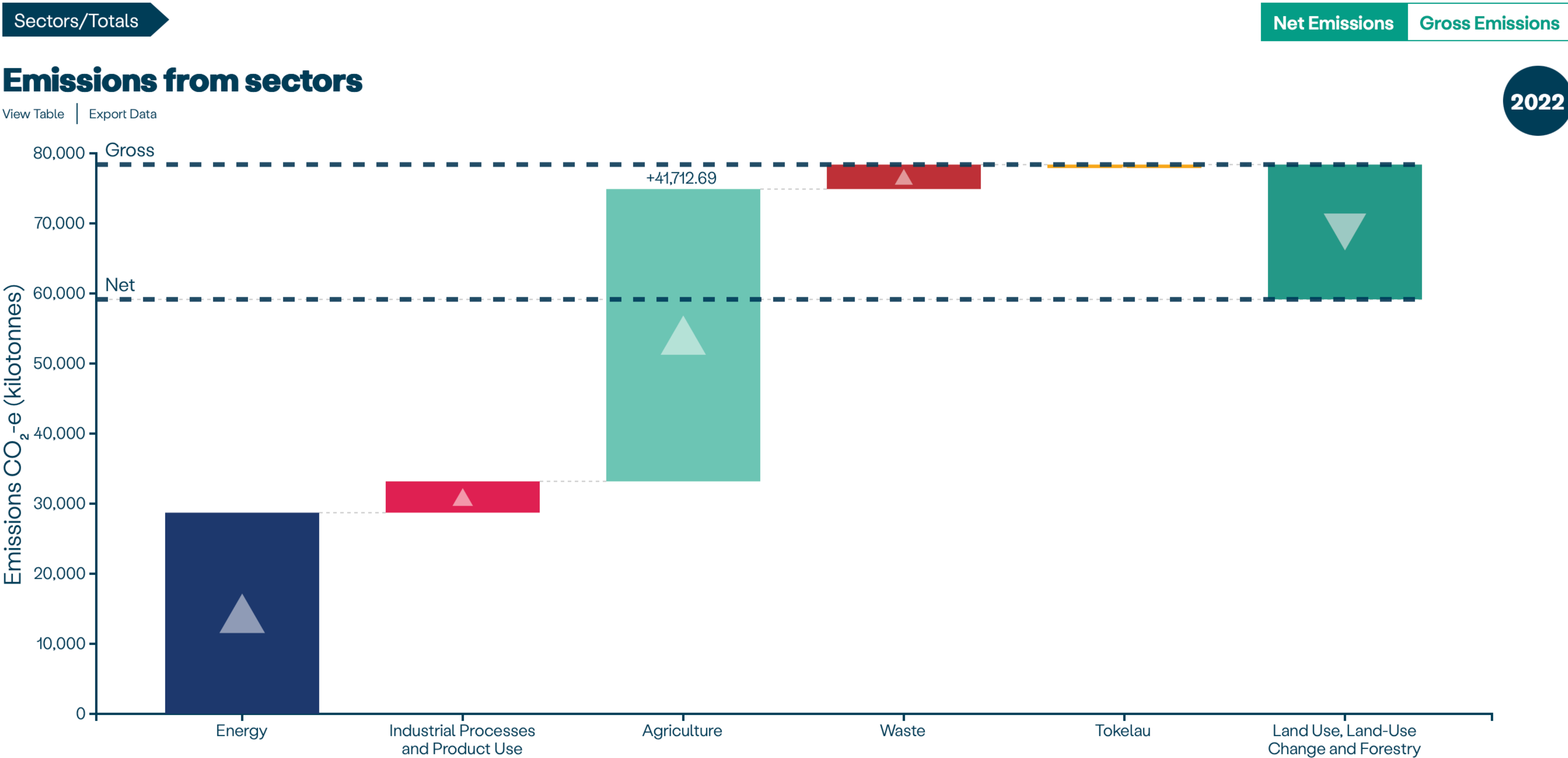
✗ Negative || Neutral ✓ Positive

✗ Negative
|| Neutral
✓ Positive

✗ Negative || Neutral ✓ Positive

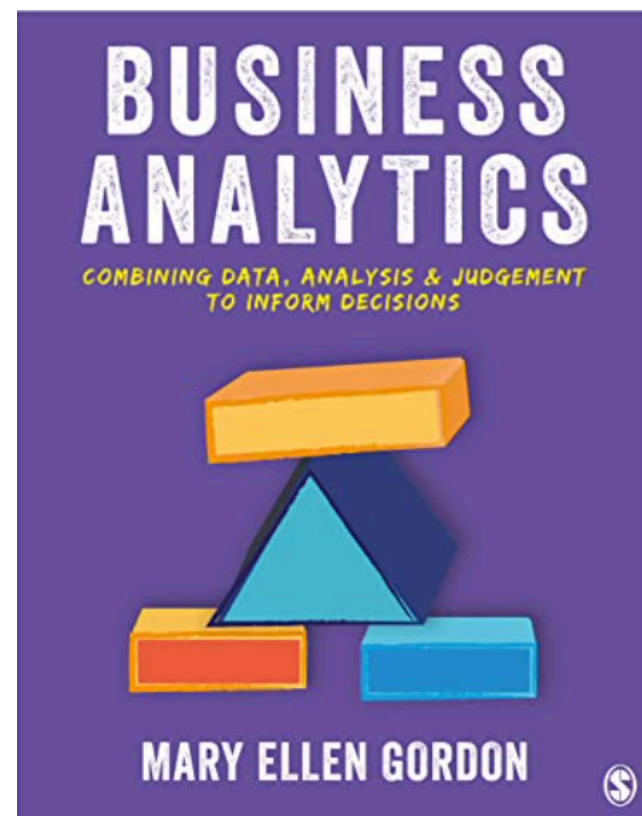
✗ Negative
|| Neutral
✓ Positive

How could we improve the way this information is communicated to the audience we identified?



Want to learn more about topics covered in this lecture?

I have a book that covers everything covered in the lecture in more detail as well as providing additional detail on data analysis and legal, ethical, and cultural considerations to keep in mind when working with data.

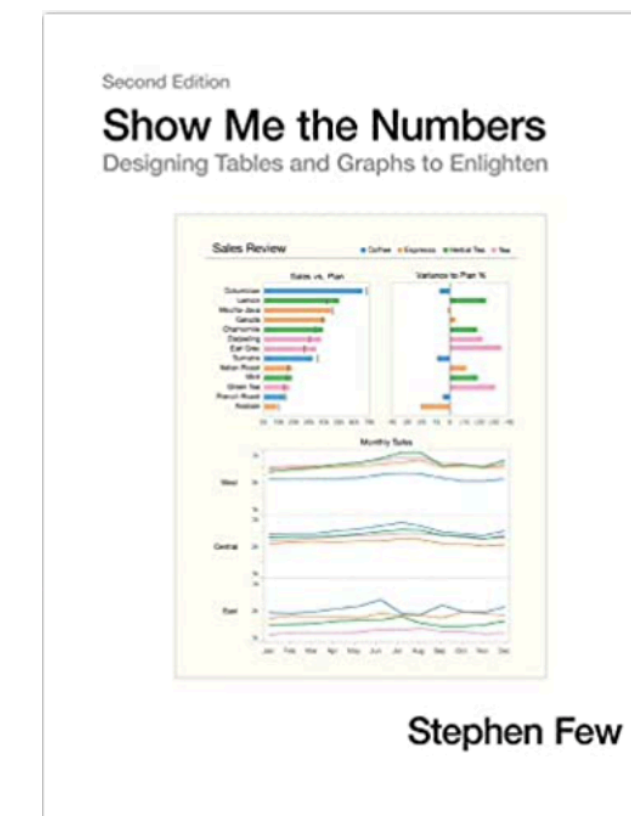


Gordon, M. E. (2023). Business Analytics: Combining data, analysis and judgement to inform decisions. Sage Publishing.

[Amazon](#)

[Booktopia](#)

I also recommend this book for more detail on data visualisation in particular.



Few, S. (2012). Show Me the Numbers: Designing Tables and Graphs to Enlighten. Analytics Press.

[Amazon](#)

[Booktopia](#)

Want to learn more about topics covered in this lecture?

I also teach these courses through Wellington Uni Professional



Delivering Data-driven Insights

Focussed exclusively on data communication
(2 day, in person)

<https://wellingtonuni-professional.nz/short-course-delivering-data-driven-insights/>



Effective Use of Data and Analytics for Organisations

Covers data analysis as well as communication
(Online: 8 * 90 minute sessions)

<https://wellingtonuni-professional.nz/short-course-effective-use-of-data-for-organisations/>

Questions, now or later...



<https://wiserwithdata.com/about>



<https://www.linkedin.com/in/maryellengordon>



meg@wiserwithdata.com