



# MEDEA Regional Guideline

Communicating metrology to  
policymakers and the public

*A practical guide to writing metrology Policy  
Briefs and Case Studies*

*November 2024*

Written by Laurie Winkless

# Contents

Context.....	4
<b>Chapter 1: The Fundamentals .....</b>	<b>5</b>
1.1 Communicating metrology.....	6
1.2 Common issues across Case Studies and Policy Briefs.....	9
<b>Chapter 2: Metrology Case Studies .....</b>	<b>12</b>
2.1 What is a Case Study? .....	13
2.2 Getting started .....	14
2.2.1 Assemble a list.....	14
2.2.2 Start writing.....	15
2.3 Key messages and language.....	16
2.4 Format.....	16
2.4.1 Snippet ( $\leq 100$ words) .....	16
2.4.2 Standard (500 - 600 words).....	17
2.4.3 Extended (700 – 1000 words) .....	18
2.5 The template in detail .....	19
2.5.1 Title and subtitle .....	19
2.5.2 The Challenge.....	20
2.5.3 The Solution .....	21
2.5.4 The Impact .....	22
2.5.5 Quote or Statement .....	23
2.5.6 Visual elements .....	24
2.6 Example Case Studies from the world of metrology.....	26
<b>Chapter 3: Metrology Policy Briefs.....</b>	<b>27</b>
3.1 What is a Policy Brief? .....	28
3.2 Format and Style .....	28
3.3 Finding the right topic.....	31
3.4 A Policy Brief template.....	33
3.5 The template in detail .....	34
3.5.1 Title.....	34
3.5.2 Key Messages .....	34
3.5.3 What's the issue? .....	36
3.5.4 Why is this important? .....	37
3.5.5 The role of metrology.....	38

3.5.6	What should policymakers do? .....	39
3.5.7	Local example .....	40
3.5.8	References .....	41
3.5.9	Bonus content .....	42
3.6	Publishing your Policy Brief.....	43
3.7	Example Policy Briefs from the world of metrology .....	43
<b>Chapter 4: Takeaways &amp; Appendices .....</b>		<b>45</b>
4.1	Takeaways .....	46
4.2	Appendix I - Author and trainer .....	46
4.3	Appendix II - Participants .....	47
4.4	Appendix III - Copyright.....	47

## Context

This document summarises a series of ‘communicating metrology’ training courses delivered under the MEDEA ([Metrology – Enabling Developing Economies in Asia](#)) programme led by Physikalisch-Technische Bundesanstalt ([PTB](#)) in Germany.

All training content was developed by metrologist-turned-science communicator, [Laurie Winkless](#). She delivered these courses remotely, using various online tools, between 2021 and 2024.

Participants in these courses were from twelve economies across the Asia-Pacific region: Bangladesh, Cambodia, China, India, Indonesia, Korea, Malaysia, Mongolia, Philippines, Singapore, Chinese Taipei, Thailand. None of the participants were communications professionals; instead, they were legal and scientific metrologists working at their national institutes or associated organisations. In all cases, English was their second language.

The training courses enabled the development of new skills amongst participants; a stated goal of the MEDEA programme. In addition, the outputs of these ‘communicating metrology’ training courses – a series of Case Studies and Policy Briefs – were deliverables of phase three of the MEDEA programme ([MEDEA 3.0](#))

The [objective](#) of the overall MEDEA programme (2013-2024) was to *“improve the ability of two regional specialist metrology networks in Asia – the Asia Pacific Metrology Programme (APMP) and the Asia-Pacific Legal Metrology Forum (APLMF) – to promote selected metrology systems in developing economies while implementing the national priorities of the 2030 Agenda and Covid-19 response measures.”* In practical terms, this involved leading and supporting capacity and competence development for both networks, as well as providing organizational and process consulting.

One the key outputs of the MEDEA programme was the development of dedicated web portal that could be used by both APLMF and APMP: <https://metrologyasiapacific.com/>

All of the Case Studies and Policy Briefs developed as a result of the training courses can be found on the web portal. Links are included throughout the following pages.

# Chapter 1:

## The Fundamentals

## 1.1 Communicating metrology

So, you're a metrologist who wants to get better at writing about their work for non-specialists? Or maybe you're a communications professional new to the world of metrology? Either way, you've come to the right place. This document has been created just for you, in an effort to help you communicate the subtleties and the real-world impact of measurement science.

The best place to start in our communication efforts is to look at lessons from the world of science communication. Now, that idea may ruffle some feathers initially, as not all metrology is scientific. However, metrology is a subject with a lot of nuance and subtlety, it requires deep thought and expertise, uses a language all of its own, and is likely totally new and unfamiliar to members of the general public. Those are all challenges that science communicators have to navigate on a daily basis.

The audiences for metrology communication are also rather similar to science communication audiences. And metrology professionals and scientists will likely partake in a similar range of communications during their careers. They include:

- ✘ Writing technical reports and proposals
- ✘ Speaking to and writing for your peers
- ✘ Speaking to and writing for interested non-specialists – e.g. journalists, and professionals from other sectors
- ✘ Communicating with customers and collaborators
- ✘ Communicating with government policymakers or funders
- ✘ Public-facing activities and educational outreach – e.g. talks at public events, speaking with community groups, visiting schools and universities.

As a result, many of the tips provided within this document should also be useful to scientists looking to write better documents.

However, here we're focusing on two target audiences – **policymakers** or other government representatives who may influence funding, and **non-specialists**, which in this context refers to engaged members of the public who might visit your institution's website. The main tools we will discuss in this guidance document are **Case Studies** and **Policy Briefs**.

However, before jumping into the specifics, there are some general things to consider when preparing to speak or write about metrology in any forum or context. The list below is not exhaustive – each one is a training workshop in itself – but if you act on each of these, you'll swiftly see a marked improvements in the quality of your interactions with all audiences.

### *Know your audience*

The single most important question to ask yourself is **who are you talking to?** Without knowing this, you will struggle to get your message across effectively. Whether you're speaking or writing, take the opportunity to do your homework on your audience beforehand – is it a journalist, a community group, a funding agency...? This knowledge is key to helping you 'tune' your language to get the best possible outcome.

The 'who' question should also help you to decide on the best format for written content. Case Studies and Policy Briefs are both excellent ways to engage with some audiences, but they can't be everything

for everyone. In addition, no matter whether you're writing an article, report, Case Study, or Policy Brief, consider where it will be published before you start writing. Your focus may be different if it's in a specialist publication, versus a post on a public-facing website.

Always assume your audience is as smart and curious as you are. Any one individual might not know what you know about metrology, but they likely have their own expertise. And finally, remember that there is more than one 'general public'!

### *The why is all-important*

The second thing you need to figure out is **why** you are talking or writing about this? In addition, why should your audience listen to **you** and why should they care about your work?

Your answer to the question "What is your goal?" should not be "To write a Case Study"! The Case Study is an output, but it should have specific ambitions. An example of a "why" might be to show the connection between specific UN Sustainable Development Goals and your work. And you aim to do that via the production of a written Case Study

This approach – one that keeps "why" at the heart of all messaging – is especially important when trying to demonstrate the role and importance of metrology to government representatives. A good thing to do before you start writing is to look at their priorities (e.g. housing, climate change, etc) and then talk about the part of your work that supports those specific priorities.

### *Key messages provide structure*

It's always very tempting to include as many things as possible into every talk or article, but it's much better to identify your key messages in advance. No matter what type of document you are developing, I recommend defining between three and five key messages (no more!).

The language, tone and style you use to talk about your work can (and should) change depending on your audience, but the key messages at the heart of those interactions should remain consistent.

Key messages should be simple enough to be understood by anyone, but able to be built upon for technically-minded audiences. They're an incredibly useful tool to use in all aspects of your business.

They also form the basis of all good Case Studies and Policy Briefs. We'll discuss them in much more detail shortly.

### *Language matters*

Speaking to your audience in **their** language is not the same thing as 'dumbing down' your work. Think of it this way – if your audience is full of people who only speak Mandarin, there's no point in speaking to them in German. If you really, truly want to *communicate*, you must use the language of your audience you're trying to reach.

For example, outside of an academic paper, it's good practise to use the active voice ('we did') rather than passive ('it was done'). This produces writing that is more enjoyable to read, and reminds your audience that metrology is done by real people.

In addition, there is always a simpler way to say something. Scientific language is made up of abbreviations, acronyms, and jargon that is impenetrable to an outside audience. This is also true for all forms of metrology. People will quickly tune out if they feel 'left behind'. Your goal should be to bring people along with you; to believe in you and your idea. To do that, they need to understand what you're

saying, and the responsibility of ensuring that happens lies with you. So yes, use technical terms where needed, but be prepared to explain them (briefly and/or with an accurate metaphor).

This is especially true when speaking to journalists. I've interviewed hundreds of scientists in my career, and despite coming from a very technical background, I sometimes struggle to understand the point of an individual's research. Extracting it can be hard work, and if I can't find the 'gold nugget' buried in amongst the noise, I'm unlikely to write about it at all. By having clear messaging, with the 'why' up front, communicated in a way that your audience can understand, you break down that barrier, and help others to tell your story and advocate for your work.

### *Stories stick*

If you want people to take something away from your talk or document, bombarding them with a range of facts is unlikely to be effective. It's much better to try to weave a story together. Take your audience on a journey with you – make them care about your work, and your failures, achievements, challenges. Human stories tend to be 'stickier' than overly technical ones, especially when speaking to people who aren't working in your sector. This is especially true when speaking to the wider public.

### *Images capture attention*

Visuals can strengthen any story, whether that's a Case Study or a conference talk.

Investing in photography for your institute can be a great idea. Having photos of your team, your facilities and your equipment can be useful for a whole range of activities. In addition, stock image website (many of them with free options) are an excellent source of impactful images.

Include photos of your team where appropriate – this, again, reminds your audience that real people are behind this piece of work.

Infographics can also add a lot of interest, and can communicate statistics very effectively, and again, there are free online resources for producing them.

We'll talk about the use of visuals in more detail later in this document.

### *Practise, practise, practise*

Written and spoken communication are skills, and like any skill, they take time and effort to master. The only way to improve your writing is to write more! The more you write, the easier it will get, and the more effective your communication will be. The same is true for giving talks – you get better at them by doing more of them.



## 1.2 Common issues across Case Studies and Policy Briefs

Across both the MEDEA Case Study and Policy Brief training programmes, I noticed some common threads. Participants would struggle with the same few aspects of writing about metrology for a non-metrology audience. I wanted to highlight them early on in this guidance document because they're relevant to both types of documents. And, as I see it, they can all be grouped under a single heading:

### Essentials vs. unnecessary details

In all forms of writing, deciding which details to include and which to exclude can be challenging. Both decisions are equally influential to the final form of the document. To make these decisions easier, I like to ask myself three 'reminder' questions:

- Who is my reader?
- Where will this document be published?
- What are my goals?

No matter what type of document you're writing, one goal should be to communicate as efficiently as possible. Your role as the author is always to help, not hinder, your reader. This is not as simple as less vs. more. It is better to ask what is **essential vs. what is unnecessary** for my reader to understand my document.

If your document will appear on a public-facing website and/or will be shared in another form beyond your organisation, it is good practise to assume your audience is international. As such, you should name your economy and/or organisation early on in the piece. You may also need to provide more context than you might expect, i.e. if you're writing this from the Philippines, but your reader is in Ireland, what prior knowledge would they require? Or, if this person is a policymaker with no background in technology, what general guidance can I provide? What context will help my reader understand why I care about this so right now?

On the other hand, some of the details that are relevant to you and your colleagues won't be relevant to your reader. When thinking about what to include or exclude, be brutally honest with yourself. Striking this balance is always challenging, no matter your level of experience (though, it does get easier).

### Essentials

Providing **relevant surrounding context** can make a huge difference to the readability of a piece of text. Here is an example of some early draft text from a Case Study, written by a trainee, compared to the text that made it into the [final version](#) of the document. Yes, the final version is longer, but it is also much more engaging and more welcoming to a typical non-specialist reader.

#### First draft

*Mobile phones have become a livelihood supplier for most people. To make the mobile phone possess more functions, the chip as the core of a phone must be continuously narrowed down, which relies on the development of semiconducting technology. Semiconducting industry dominates the economic growth in Chinese Taipei.*

## Final version

*Mobile phones have become ubiquitous, with 15 billion of them found worldwide; that's two mobile phones for each person on the planet. At the heart of every mobile phone is a powerful microchip which provides all of its functions, from 5G connectivity to graphics.*

*Chinese Taipei leads the world in manufacturing these high-tech semiconductor microchips, which, thanks to developments over the past few decades, have continuously shrunk in size, while still improving in functionality.*

## Neutrals

**Acronyms** are plentiful in the worlds of both science and metrology, so they're likely to feature in any document you might write. These are unique in that they are – in my opinion – neither essential nor unnecessary in public-facing documents; they sit somewhere in the middle. However, they are frequently misused which can lead to confusion. I recommend following these four rules:

1. Acronyms be useful.... but you need to define them first, **e.g.** Don't write "EVs" before you've written "Electric vehicles"
2. Words first, acronym second. Sometimes, when naming your institution, this can be done in reverse, **e.g.** National Institute of Metrology, Thailand (NIMT) or NIMT, the National Institute of Metrology Thailand.
3. Only give acronyms to things that you refer to repeatedly (at least twice) in the document, **e.g.** you don't need to include 'ppt' if you only say 'parts-per-trillion' once.
4. If you're including an infographic, plot or any type of separate 'box out' section in your document and refer to the acronym in it, be sure to define it again.

## Unnecessary

Something unique to metrology-related written content is the widespread use of ISO (International Organization for Standardization) references, National Standards, Working Group, and Technical Committee (TC) numbers. While such references are undoubtedly important to your colleagues working in metrology or adjacent industries, they are extremely unlikely to mean anything to your target audiences (policymakers, non-specialists).

For your reader, seeing something like "EURAMET TC IM 1448" in the middle of a sentence does not add to their understanding, and in fact may just cause confusion. **In the context of Policy Briefs and Case Studies, a reference like this is a barrier to communication, not an aid.** As such, I strongly recommend **not** using ISO or TC numbers at all, and instead, describe what it means for your reader.

Here is an example of a first draft from a real MEDEA Case Study.

Therefore, in order to conform to the digital era, NIMT has transformed the calibration certificate from "analogue paper-base" to "Digital Calibration Certificate", or DCC.

DCC is not only the scanning of a paper calibration certificate to an electronic file or pdf file, but it is the format followed by EURAMAT TC IM 1448. It serves for long-term archiving, machine-readable, traceable directly to the national standards, and serves as proof of metrological traceability and cryptographic signature.

After several rounds of edits, this is what appeared in [the final version](#) of the same Case Study.

NIMT has transformed the calibration certificate from analogue and paper-based to digital calibration certificates, or DCCs. A DCC is not merely a scanned, electronic copy of a paper calibration certificate. Its format has been defined by EURAMET (European Association of National Metrology Institutes), and adopted worldwide. To meet that standard, DCCs need to be machine-readable with a cryptographic signature, traceable directly to the national standards, suited to long-term archiving, and serve as proof of metrological traceability.

In addition, describing the internal structures of an organisation, or providing the names of specific teams within an organisation, is very unlikely to add to the reader's understanding of the challenge or project. In general, if information isn't integral to the story you're telling, omit it.

### *And finally...*

If you're new to writing for non-specialist audiences, I encourage you to get into the habit of writing drafts and sharing them with colleagues as early and often as you can. No published document you've ever read was written perfectly first time!

Editing is a critical part of writing – it cannot be skipped over – and every draft you produce helps you become a better writer. Opening yourself up to feedback may feel daunting, but in terms of producing an impactful document, it is more effective than going alone. And it will make you a better writer.

## Chapter 2:

# Metrology Case Studies

## 2.1 What is a Case Study?

Case Studies are a useful communication tool – one of many – that can be used to succinctly summarise the impact of a project. You'll find examples of them across virtually every sector. In this document, we'll focus on their use in metrology.

A metrology Case Study is a method of demonstrating the value of metrology to a particular audience or to a range of audiences

A good Case Study should be:

- **Specific** – focused on one project, service, or relationship
- **Timely** – ongoing, very recent, or related to a current issue (e.g. COVID-19)
- **Targeted** – fit for use in your economy
- **Relevant** – interesting to your audience
- **Positive** – demonstrating real-world impact of metrology

The goals of a metrology Case Study will vary depending on a range of factors – your economy, funding system, institution, target audience, etc. In general, Case Studies can be used to:

- **Inform** – e.g. we developed a new measurement service
- **Engage** – e.g. measurement is a global language
- **Persuade** – e.g. funding metrology drives improvements in industry
- **Demonstrate impact** – e.g. metrology helps telescopes see further
- **Celebrate success** – e.g. client has improved the quality of their produce

However, a single Case Study cannot do everything. I'd also argue that it should not be viewed as a project output as and of itself. Rather, it's important to identify the purpose of this Case Study early on, and remind yourself of it often during the writing process. Establishing **why** you're writing it is just as important as the content itself.

Even within the relatively limited world of metrology, there are lots of different types of Case Studies that you can produce. They can be project-specific, topic-specific, client / collaborator-specific, or sector-specific. They can be related to long-term work or on one-off or bespoke pieces of work. All are useful in different circumstances, and none are more effective than one another.

Choosing the 'right' focus is really all about your goals for the document. What do **you** specifically want to achieve, and who you are hoping to reach?

## 2.2 Getting started

### 2.2.1 Assemble a list

If you already have an idea for a great Case Study, skip to **Section 2.2.2**. If you don't know what a potential Case Study story might look like, or how to find one, please read on.

The first step to take is to make a shortlist of any recent (within the last 18 months) projects, clients, or research you were involved in.

- *E.g.* we worked with Methanex to measure furnace temperature
- *E.g.* we ran a training session for a new industry client

Need ideas? Talk to colleagues! You could also read annual reports, newsletters, papers, and any other publications from your organisation.

Once you have that starter list of story ideas, for each one identify

- Who might be interested in this (the audience)
- What is interesting / surprising / novel / important about it
- The customer or collaborator involved (or the relevant industry)
- The technical expert in your organisation (if it is not you)

You may have your own preference for collating and organising this information, but I like to do it in a simple spreadsheet. Here's an unedited excerpt of a Case Studies spreadsheet that I put together several years ago. It includes examples from different clients, including NZ's Measurement Standards Laboratory.

Project	When	Why	Audience	Customer	Expert
Measured furnace temperature in methanol plant	Jul-Dec 2020	Industrially relevant, direct impact on the operation of the business	Heavy industry	Methanex	Peter S
Hosted visiting researcher from paint industry	Aug-Nov 2020	Supported the company to develop a brand-new product (fire regs)	Construction industry, Funders	Dulux	Serge P-M
Local market - weighing scales project	Jan 2021	Clear impact on general public who shop in these markets (restore trust). New approach that was considerably better than previous attempts	Government, public	Santiago City	Michael J. A. S
Developed new technique for measuring volume	May 2020	Direct immediate benefit to craft breweries - much cheaper than existing solutions. Close collab with Trading Standards	Public (craft breweries), regulators, beer industry	Trading Standards	Y-H Fung

I've highlighted the audience here because – as with all communication outputs – it has a significant impact on the eventual shape and tone of a story. While a well-written Case Study can successfully reach more than one audience, it's important to choose one specific audience before you start writing it. Knowing your audience, and thinking about them at every stage of the writing process, is the key to writing a good Case Study. Always ask yourself, who do you want to reach? Some likely audiences include:

- Funders (e.g. government, industry, foundations, venture capitalists...)
- Peers (e.g. other metrologists or professionals)
- Customers (current or future)
- Regulators
- Academics or other collaborators
- The general public(s)

For me, the key 'secret' audience for every STEM-related (science, technology, engineering, maths) Case Study is **a government representative with no background in science**. If in doubt, write your Case Study with that person in mind.

When you have assembled a list of potential Case Studies, discuss it with your colleagues. Conversations tend to spark more ideas than deep solo thinking. Be ready to prioritise – there is likely to be more than one story that you'll want to develop, but you may only have limited time. I also encourage you to make the list collaborative, and encourage your colleagues to get involved in populating it, and writing the Case Studies.

## 2.2.2 Start writing

The #1 lesson I've learned as a writer – perfection is the enemy of done.

New writers always try to write 'the perfect' sentence first try, but that is an exceptionally difficult thing to do, and focusing on achieving perfection can lead to frustration and ultimately, defeat. Take some pressure off yourself. Remember that every good piece of prose ever published has likely been drafted, shredded to pieces, rebuilt, edited, shredded again, edited, and then (maybe) finalised.

Rather than viewing 'writing' as a single process, it's less overwhelming and more effective to split the process up into stages. For example, we start with brainstorming (by yourself, then with colleagues), before we move onto prioritisation and critical thinking. Then it's onto research, where we collect any information that we might need. Only then does the drafting / writing begin, and you can expect it to be the step that takes the longest. Editing comes later, and may well happen over multiple rounds.

I like to begin with an empty document, into which I drop the basic information about the Case Study (taken from my spreadsheet). I then start adding general notes, ideas, references, links, inspiration, outstanding questions, or any other potentially useful content. I treat this document as my preparation area – it's where I gather and prepare all my ingredients before I start actually 'cooking' the recipe. No-one but me ever sees this document.

Once I have a rough overall idea of what I'd like to include in my Case Study, I start thinking about the key messages.

## 2.3 Key messages and language

The key messages of any document are your ‘elevator pitch’ or ‘hooks’ – the central points you want to communicate to your reader. It’s important to start developing them early on in the writing process, because they help to shape the document.

Key points don’t appear in their own dedicated section in a Case Study. Instead, they are sprinkled throughout the document.

In general, less is more. **No Case Study needs more than 5 key points**

Here is an example of the raw / draft key messages of [a real Case Study](#) developed for MSL:

1. Very close working relationship between Kiwistar and MSL. Share labs and expertise = unique facility from start to finish of lens-making
2. Length measurement vital to lenses and spectrographs (CMM)
3. Photometry and radiation also play key role (wavelengths)
4. Latest project is WEAVE + Hershel Telescope (in the Canary Islands)

When developing your key messages and drafting the rest of the content, be sure to use language that your audience will recognise. Technical terms are fine as long as you can explain them simply and briefly. Certain words are useful in any metrology Case Study, regardless of the target audience. These include:

- Knowledge, Expertise, Experience
- Reliability, Quality, Trust, Confidence, Regulations
- Accuracy, Precision, Traceability, the SI (if described)
- Enable, Support, Facilitate, Collaborate, Make possible, Improve.

## 2.4 Format

There are lots of potential formats a Case Study can take. The most common three are included here.

### 2.4.1 Snippet ( $\leq 100$ words)

Running to less than 100 words, snippets are less like a true Case Study, and more like a headline or elevator pitch. They tend to be most useful where space (or time) is tight, or where the focus of sharing a success story is to use it to drive business development across a range of sectors.

Despite their short length, snippets can be challenging to write! For this reason, they are generally not recommended for people new to writing Case Studies.



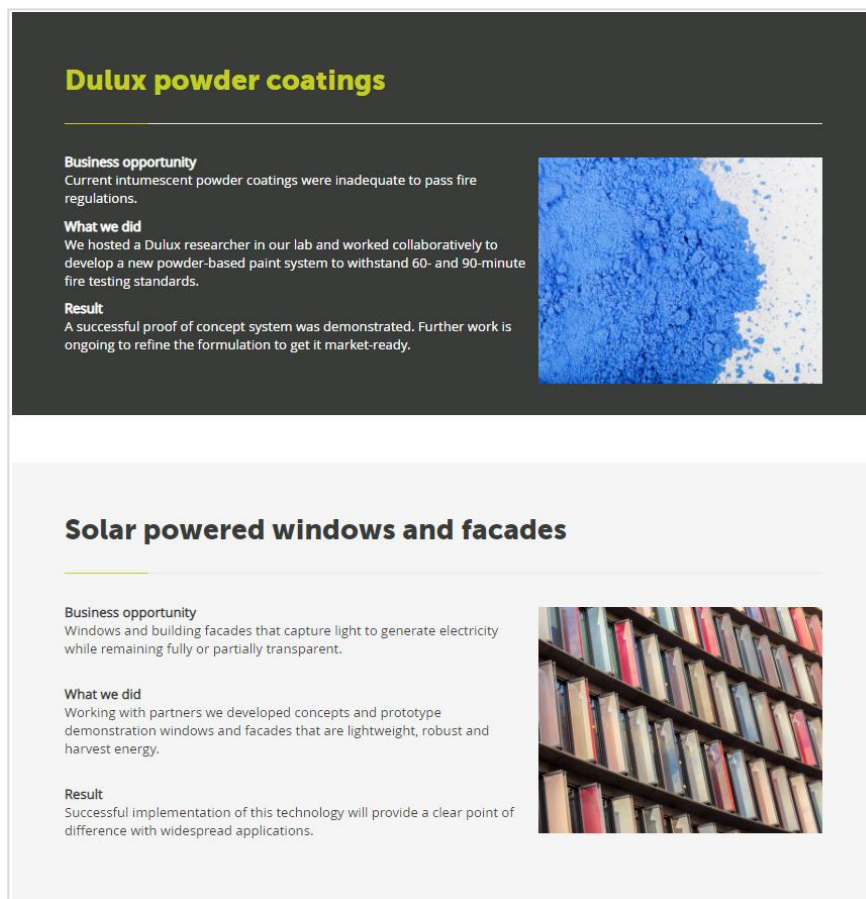


Figure 1: Examples of 'snippet' Case Studies from the UK's National Physical Laboratory (no longer visible on the NPL website)

## 2.4.2 Standard (500 - 600 words)

If you look at Case Studies from across a range of sectors, you'll see that many of them follow a similar format, which is based on three main sections:

- **Challenge** – this provides context and an overview for the reader. A summary of the specific issue being faced.
- **Solution** – this lays out how a lab / company / institute used their expertise to meet that challenge.
- **Impact** – the demonstrable change and/or benefit that came about as a result of the solution.

This structure is common because it is simple but effective. It guides the person writing the Case Study, prompting them to focus on the essentials, and it defines a clear path for a reader, taking them smoothly from question, to answer, to outcome. Case Studies written in this way are especially good if your audience includes industry representatives or decision-makers (e.g. government and funders).

Not all metrology stories can fit neatly into a structure like this, and as we'll discover, there are other approaches available. But for someone new to writing Case Studies, or someone who wants to keep messaging, style, and tone consistent across a range of stories, following a simple template can be a good option.

**For MEDEA training courses, this is the approach that was selected.** We developed the following template, and asked all participants to follow it when preparing their Case Studies. By sticking to the recommended word counts in each section, they would produce a Case Study that ran to ~500 words.

<b>Title</b> <7 words
<b>Subtitle</b> <12 words
<b>The Challenge</b> 125 words
<b>The Solution</b> 200 words
<b>The Impact</b> 100 words
<b>Customer Quote</b> <75 words
<b>Header image</b>
<b>Graphic or Statistic</b>

Participants spoke positively about this approach, describing the template as “helpful” and “a good starting point.” As most participants were complete beginners to writing Case Studies, they felt that this template provided sufficient structure to guide their writing process, but still left enough flexibility for them to tell a unique, engaging story.

As a result, this will be the format that we’ll predominantly focus on for the rest of this chapter.

To support the learning aims of this document, several ‘real-world’ metrology Case Studies that follow this format will be referenced:

1. We’ll use annotated metrology Case Studies (from New Zealand’s Measurement Standards Laboratory, MSL) to provide some practical guidance on how to develop an effective document.
2. Links to the Case Studies produced by MEDEA training program participants will be provided, in order to illustrate what can be achieved by metrology professionals with little (or no) prior experience of writing documents like these.
3. Links to sample Case Studies produced by communications professionals at the UK’s National Physical Laboratory (NPL) and MSL will also be provided.

### 2.4.3 Extended (700 – 1000 words)

For those with prior experience of writing Case Studies, or who have a story to tell that doesn’t fit neatly into the template above, another option is to write something more like a news-style article. These are generally much longer than a typical Case Study – somewhere between 700 and 1,000 words – which provides more space for nuance and detail. This style of Case Study also tends to be better suited to a more technically-minded audience (e.g. collaborators). It’s also an especially good option for writing about ongoing relationships or long-term projects.

While they can share some similarities with those that follow a template, article-type Case Studies are more challenging to write, particularly for beginners. They require you think more like a journalist or a storyteller, because you have to find and shape the narrative arc.

There are two real-world examples of extended metrology Case Studies on the MSL website:

- Probing the quantum realm ([link](#))
- A world first for Thermocouples ([link](#))

## 2.5 The template in detail

Here, we'll go through each of the main elements of the Case Study template. The visual elements (the header image and the graphic or statistic) will be the final elements discussed. Let's start with the title.

### 2.5.1 Title and subtitle

<b>Title</b> <7 words
<b>Subtitle</b> <12 words

**Title:** It should be very short, non-technical, and eye-catching

- It doesn't need to tell the whole story – just hint at it
- It can be fun and 'playful'.

**Subtitle:** This is optional, but highly recommended

- It's a way to reference the outcome / the 'bottom line'
- It adds detail so that the main title can stay short
- It works well for sharing the story on websites and social channels.

The title and subtitle are often the very last things I finalise in a Case Study – don't be surprised if you draft and re-draft these repeatedly as you write the rest of the document. Experiment with as many options as possible, until you find the right one.

#### Title Examples

Here are three title (**bold**) and subtitle (*italics*) examples from real Case Studies I developed for MSL. All of these fit the template. As you can see, you can say a lot in surprisingly few words!

✕ **Quantum Balancing Act for the SI** ([link](#))

*Novel measurements support redefinition of the International System of Units*

✕ **Revealing the Wonders of Deep Space** ([link](#))

*MSL supports KiwiStar Optics to deliver precision optics for astronomy*

✕ **Taking the temperature of industry** ([link](#))

*Accurate temperature measurement is vital in countless industries; from pharmaceuticals to manufacturing*

## 2.5.2 The Challenge

### The Challenge

125 words

This section gives the reader an overview; to provide them with useful **context** and set the scene for the rest of the Case Study. I like to think of the Challenge section as the frame within which you'll paint a picture for your reader.

- It should include general information on the industry, and their specific needs
- It might make an initial link between that industry and reliable measurement
- It might mention the customer or collaborator
- It could pose a question

The language should be simple and sentences short to make it easy to read. When deciding what to include or exclude from this section, it's important to remember your overall goal – to engage the reader so that they recognise the value of metrology.

### Challenge Example

This challenge section is taken [from a real Case Study, written for NZ's Measurement Standards Laboratory](#). The focus of the story was on MSL's work in the aviation sector, and their continued relationship with the national carrier, Air New Zealand. Some of the key words, ideas, and phrases have been underlined here as a learning aid.

#### The Challenge

Reliability is at the core of the aviation industry. Long before an aircraft reaches its departure gate, it has undergone thousands of hours of inspection, testing, and maintenance. Measurements play a key role in providing that reliability – everything from the smallest bolt to the widest wingspan must pass through the hands of calibration engineers.

At the manufacturing phase too, accurate measurement is a priority. Furnaces used to heat-treat components need to be calibrated to ensure their uniformity, and jet engines need to be carefully balanced before they can pass critical vibration tests. But, as in any safety-critical industry, regulations for aircraft are constantly evolving, and that's a challenge for everyone involved. With developments in engine and materials design continuing at pace, how can businesses stay aligned with the regulator?

### 2.5.3 The Solution

#### The Solution

200 words

This section is the longest in the Case Study template, so it represents the bulk of the content. It's here that you showcase your unique solution and the skills and expertise that your organisation offers.

The star of this section should be measurement, and you'll also very likely mention your customers and/or collaborators. The details here can be somewhat technical, but don't lose sight of your target audience.

Remember, a Case Study is not a peer-reviewed research paper. It's ok to add some 'human' into it. Be sure to use the active over the passive voice – i.e., Use 'we measured', not 'it was measured'. And emphasise words like *shared*, *trust*, and *collaboration*. It is important to show that you as metrologists can – and already do – work well with non-metrologists.

#### Solution Example

This example is taken from [the same MSL Case Study as before](#). Highlights again added for emphasis.

##### The MSL Solution

MSL has worked closely with Air New Zealand for more than two decades. What started off as a calibration service agreement quickly morphed into a relationship based on shared knowledge.

Our pressure and temperature calibration training courses are on the curriculum for all new Air New Zealand calibration engineers, and we have also trained specialist engineers in humidity and infrared thermometry. Elsewhere in the aviation industry, we have calibrated transfer artefacts that are widely used, including microscope slides for precision length measurement, and a tool for determining the roundness of specific engine components.

Companies that wish to develop new measurement capabilities, or extend existing ones, can access our technical expertise as a service. And finally, MSL scientists act as technical assessors for IANZ (International Accreditation New Zealand) which, in turn, accredits Air New Zealand's calibration laboratories.

## 2.5.4 The Impact

### The Impact

100 words

The star of this section is the customer or collaborator. Here, focus on the outcome of the work. If you're unsure of what to include here, start by answering the following questions:

- What change did your solution make?
- What has it allowed the customer to do?
- Why was it important to them / to the industry in general?

Carefully consider the language you use here. You want to remind readers that metrology has a real-world impact, and is valuable to a range of industries. Emphasise again what a metrology lab offers over other options – trust, confidence, expertise, reliability, traceability, etc.

### Solution Example

This example is again taken from [the MSL - Air NZ Case Study](#). Highlights are added to show some of the key terms and phrases. In this instance, a short customer quote is incorporated into the body of the text, but this may not always be possible. An easier and more common option is to include a quote or statement from a customer or collaborator in a separate 'box-out' section towards the end of the Case Study. More on this below (Section 2.5.5)

#### The Impact

MSL support allows companies like Air New Zealand to respond quickly to changes in regulations, and to changes made in-house as part of a wider business improvement effort. Our training courses are an important aspect of this. Geoff Clark, from Air New Zealand Calibration Services, said, "Regularly importing fresh learning allows us to revisit and improve our processes, and gives the engineers an opportunity to share information with and learn from MSL."

But beyond that, we can offer a vital safety blanket to all companies working in aviation. By having confidence in your measurements, trust in your calibration engineers, and a direct link to the best metrologists in NZ, you can ensure that your aircraft keep flying.

Quote from the customer

## 2.5.5 Quote or Statement

### Customer Quote

< 75 words

In a Case Study, it's always worth trying to include the voice of the customer or project collaborator, and the reason for this is simple: For any reader, a short, positive quote from some external to your organisation will carry much more weight and a higher value than words written by someone internal to your organisation. Think of it as a review – it is the best possible way to directly demonstrate the impact that metrology has had on a specific business and/or on industry.

How you approach someone for a quote depends on your existing relationship with them. For example, some labs have a policy of collecting feedback from all customers as part of their commercial offering. That can be a useful starting point, but it is important that you confirm that your customer is happy for their words to be published.

I've generally found that the best option is to phone or email a representative of that organisation and ask if they will provide a quote. Be clear and open about what you need and how it will be used. If you make any edits to a quote – however minor – be sure to get approval before publishing.

### Quote Examples

1. From [this MSL Case Study](#):

*"We're in the fortunate position of having a close and positive relationship with our national lab. The knowledge and expertise of MSL scientists allows us to respond quickly to regulation changes, and gives us the confidence to know that our measurements and calibrations – and the components they refer to – can be trusted."* [Geoff Clark – Air New Zealand Production Leader, Calibration Services](#).

2. From [this MEDEA Case Study](#):

*"Working with NIMT has a positive impact on Thailand's agricultural industry. We're grateful to NIMT for their vision and their efforts to provide the best standard CRM that gives us confidence in the accuracy of moisture measurement in rice and paddy in Thailand."* [Mr. Ratchapak Charoenthaipanich – NGEK SENG HUAT Ltd., Thailand distributor of Kett Electric Laboratory Co. Ltd.](#)

3. From [this MEDEA Case Study](#):

*"It is our responsibility to provide the best service which is trusted by customers as a guarantee on every payment we receive. The safety of road users is our priority and should always adhere to the rules that have been outlined. Working with NMIM on this project has helped our business considerably to ensure that the level of measurement quality is always maintained."* [Mr Anuar Abdullah - Head of Engineering and Project Management Department, PUSPAKOM](#).

4. From [this NPL Case Study](#):

*"It's about the quality and pedigree that NPL bring as a third party to verify the results we've obtained. If we claim a certain sensitivity, we can reference back to the NPL figures."* [Dominic Lavin, Lead Research Physicist, Creavo](#).



## 2.5.6 Visual elements

These two elements have been grouped together because they share some similarities, the use of either (or both) can strengthen any story, and because they are often the last things that are considered when preparing a Case Study. A graphics designer was not employed to work on the MEDEA Case Studies. Instead, free or low-cost imagery was utilised to make them visually interesting.

### Header image

A header image for a Case Study should be:

- Broadly representative of the work
- Eye-catching
- Shareable (either via creative commons or paid-for license)
- High-quality, high-resolution photo

For a metrology Case Study, I generally recommend using a visually-interesting stock image as the header image – many are available for free. Other options include photos of metrologists at work in the lab or in the field; particularly if your organisation can invest in getting professional photography done. Or if a collaboration is the focus of the Case Study, group or team photos can also work.

Header images should never be a technical image, i.e. a schematic, 3D rendering, or data plot. The role of this image is to draw readers in. Given that we're targeting a more general audience, it's best to keep it simple.

Below are some images from [Shutterstock](#), sourced for a suite of MSL Case Studies. Using a site like this can be expensive, but it provides access to millions of images in an ever-growing database. Consider whether or not this would be a worthwhile investment for your organisation. At the time of writing (November 2024), Shutterstock subscribers could access 10 images per month for US\$29.



There are a growing number of stock image sites that offer royalty-free images and videos. [Unsplash](#), [Pixabay](#), and [Pexels](#) tend to be my go-to option when looking for attractive, free-to-use images. I generally recommend *against* using AI-generated images, as they are mired in [intellectual property controversy](#).

In addition, sites like [Wikipedia](#) and [Flickr](#) share many photos under one of six [Creative Commons licenses](#). Only CC0 images are fully in the public domain (i.e. they can be freely used with no conditions). The other five CC licenses have conditions on their use. Be sure to check which license applies to any image you wish to use, and ensure that you meet their conditions fully.

In all cases, when looking for header images, be creative with your search terms. For example, when writing an electricity standards-focused Case Study, I searched for 'spark', 'lights', 'lightbulbs', 'warm light', 'power', etc.



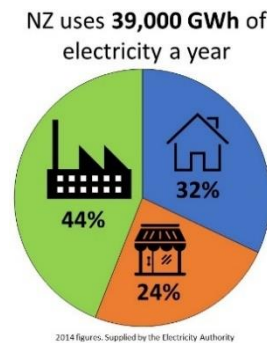
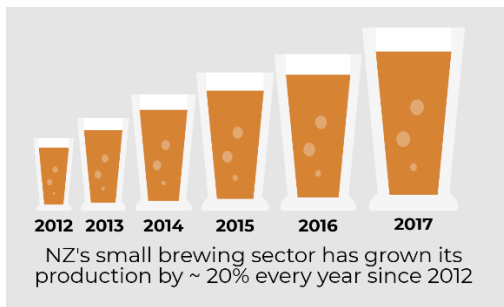
## Graphic or Statistic

Another element you can potentially add to your Case Study is a simple infographic, or a visual representative of a statistic. This is in no way mandatory, but it can be an attractive, fun addition.

In either case, this element should provide the reader with some relevant information and/or broader context. It doesn't have to be directly related to the specific project outlined in the Case Study; it can be more general, e.g.: we've supported 10+ industry partners using this service, our support saved 3-4 months development time, etc.

In an ideal situation, organisations should employ a professional graphic designer to develop infographics – that will undoubtedly offer the best outcome. If in-house support is not available, there are many excellent freelance designers who work on a contract basis, and some have specific expertise in communicating scientific concepts and other technical subjects. In New Zealand, I regularly work with [StudioC](#) and [ReMaster](#).

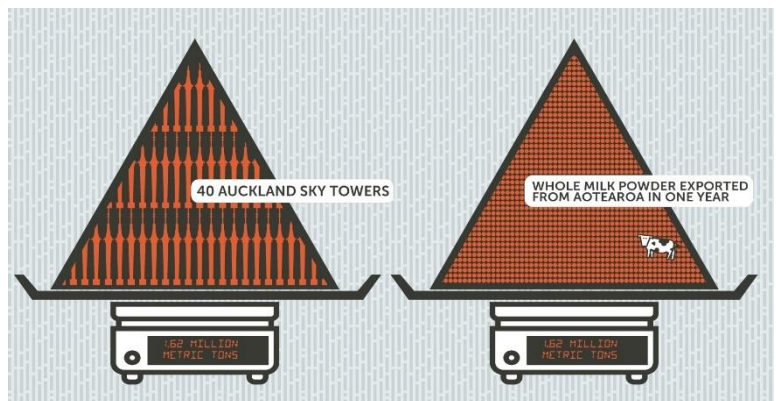
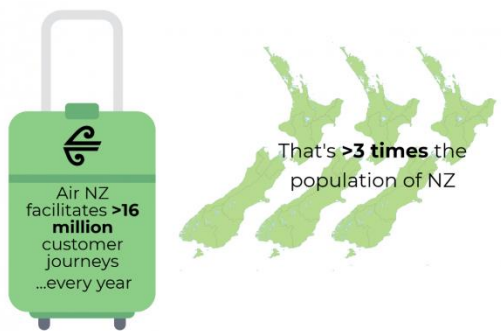
However, if budgets are tight, there are lots of free and/or easy-to-use online tools that can provide some of the same functionality. Powerpoint with some free icons and clipart is the most basic option, but it may be sufficient for your needs. Here are two simple graphics created for MSL using only free resources.



To level up, I recommend using a tool like [Piktochart](#) or [Canva](#). Both provide a basic version of their platforms that is free to use, with full access requiring a subscription. At the time of writing, Canva Pro was NZ\$180 per person per year, and Piktochart Pro was US\$168 per person per year.

Both tools are relatively straightforward to use, with lots of templates provided, and plenty of scope to experiment and personalise.

As an aside – visuals like these are not just useful for Case Studies – attractive graphics can also be a great addition to presentations and reports. Two examples below. The one on the right was produced by a professional graphic designer.



## 2.6 Example Case Studies from the world of metrology

The following ten Case Studies were produced by participants of the MEDEA training course. All follow the recommended template.

1. **Bringing metrology into the classroom:** *Thai metrologists increase awareness of the science of measurement through nationwide initiative* ([link](#))
2. **Paving the way for Korea's Electric Vehicle era:** *KRISS establishes high-power DC energy standard for fast charging stations* ([link](#))
3. **The issue with water flowmeters:** *Metrologists tackle an ongoing challenge in Mongolia's water supply* ([link](#))
4. **Putting length metrology into 3D laser scanning:** *NMIM supports vehicle inspection to adopt a critical new technology* ([link](#))
5. **Measuring the moisture content of rice:** *Thailand's agriculture sector benefits from metrology-industry collaboration* ([link](#))
6. **Ensuring the production quality of high-tech chips:** *Key reference materials support Chinese Taipei's semiconductor industry* ([link](#))
7. **Powering Mongolia's grid through metrology:** *International collaboration provides new tools and extends the country's electrical standards* ([link](#))
8. **Upskilling metrology workforce through international collaboration:** *Cambodian metrology technicians gain new skills through working with China* ([link](#))
9. **Calibration certificates undergo digital transformation:** *Thai metrology institute welcomes the digital era* ([link](#))
10. **Multinational Manufacturer Embraces NMI's Services:** *Filipino metrologists help Japanese company to stay balanced* ([link](#))

The ten Case Studies below were produced by the communications team at NPL, and by a metrologist-turned-comms professional for MSL. These largely follow the template, but the word count and structure may differ in some instances.

1. **[NPL] Accelerating the production of composites to decarbonise aviation:** *NPL used nano-Raman spectroscopy to investigate composite production* ([link](#))
2. **[NPL] Independent verification of novel heart disorder diagnostic device:** *Non-contact heart disorder diagnostic device could help target treatments and save lives* ([link](#))
3. **[NPL] Optimising the mechanical properties of nanocomposites:** *Understanding how the surface chemistry of functionalised graphene affects the properties of nanocomposites* ([link](#))
4. **[NPL] Validating alkaline water electrolyser performance & durability for OxfordNanoSystems:** *NPL helps to reduce the cost of green hydrogen* ([link](#))
5. **[NPL] Validating nanoparticles for calibration standards:** *NPL assessed the physical attributes of Stream Bio's CPNs* ([link](#))
6. **[MSL] The Look of Luxury:** *How optical measurements help products catch our eye* ([link](#))
7. **[MSL] Quantum Balancing Act for the SI:** *Novel measurements support redefinition of the International System of Units* ([link](#))
8. **[MSL] Flicking the Switch on Electricity:** *Helping to secure NZ's supply, now and into the future* ([link](#))
9. **[MSL] Revealing the Wonders of Deep Space:** *MSL supports KiwiStar Optics to deliver precision optics for astronomy* ([link](#))
10. **[MSL] Come Fly with me:** *MSL support keeps NZ's aviation sector in clear air* ([link](#))

## Chapter 3:

# Metrology Policy Briefs

## 3.1 What is a Policy Brief?

Policy Briefs are a highly targeted communication tool, written with a specific audience in mind – politicians, government policymakers, and others interested in formulating or influencing policy.

Each brief is typically a concise summary of a particular topic or issue, written by an expert to help readers understand and likely, make decisions about, that topic. Policy Briefs are widely used to advocate for research or expert-based analysis, or to cast a policy lens on an issue. They are just one of many ways to disseminate knowledge.

Like Case Studies, Policy Briefs are popular across a wide range of sectors; particularly those that regularly interact with government representatives. Because each sector will have its own priorities, goals, and timelines, the structure of a Policy Briefs is not fixed.

However, its name hints at one of the most important characteristics of any Policy Brief – it should be **short**. This is to ensure that it meets the needs of its future readers.

On average, policymakers spend no more than 60 minutes – and often as little as 30 minutes – reading a policy document.

In any given week, your brief will likely be just one of a large number on a policymaker's 'to-read' list. Authors should therefore keep the time-poor nature of the target audience means front-of-mind at all times. Regardless of the sector, presenting key messages clearly and concisely should be the top priority. Having a simple layout and structure will also aid the reader, guiding them through the Policy Brief as efficiently as possible.

## 3.2 Format and Style

In terms of word count, Policy Briefs typically fall onto one of two length categories

- 1 – 3 pages (700 – 1500 words)
- 4 – 6 pages (< 2500 words)

You will likely come across examples of longer Policy Briefs (7 – 10 pages or > 4000 words) online, but they are not generally recommended, as they cannot be read in an hour. And, I'd argue that anything longer than 10 pages should be considered a policy report, rather than a Policy Brief.

Policy Briefs are an effective way to bring important research to the attention of policymakers, precisely because they can be read in a short amount of time. So, clarity of message should be a key goal when writing such a document. A clear and easily-digestible Policy Brief is much more likely to be read and acted upon by your target audience than a dense, detailed, academic-style report.

While there is no 'set' structure, the most effective Policy Briefs tend to use lots of headings and have relatively short sections. They're also likely to include visual aids, such as graphs, charts and images. Statistics and data can help emphasise key messages, and 'white space' makes the information easier to absorb.

Here are some visual examples of Policy Briefs from outside the world of metrology. They fit into the two length categories and use many of the elements mentioned. Links to the original document are included in each caption.

Figure 2: <https://www.ipr.northwestern.edu/our-work/policy-briefs/>

Figure 3: <https://odi.org/en/publications/rising-food-prices-cause-for-concern/>



[illegible]

In general, a successful metrology Policy Brief should....

- **Be short and concise**, so as to focus attention onto key points. Some repetition or emphasis is also fairly common.
- **Be well-defined, and focused in scope**. The goal is to demonstrate impact, change behaviour and/or motivate policy changes around a *specific* topic.
- **Speak to the target audience**. A brief cannot be everything for everybody. The target reader is a policymaker, not a fellow metrology expert.
- **Function as a standalone document**. Briefs are primarily used by those who have relatively little context, or who may lack access to additional information.
- **Use data, graphics, images, tables**. These are often the clearest, most succinct way to make a point.
- **Be convincing and interesting to read**. It should act like an engaging ‘welcome’ to a specific issue, rather than a thesis or a peer-reviewed paper
- **Favour clear language over jargon**. The tone should be professional, not academic.
- **Communicate the practical implications of metrology**. A brief should draw a direct line between a known challenge or issue and the solution that metrology offers.
- **Include links to key references**, but not a detailed bibliography

For the MEDEA programme, there was an additional condition – the Policy Briefs should **be relevant to (and suitable for use across) all MEDEA economies**. Taking this approach allowed us to further emphasize the collaborative, international nature of metrology.

### 3.3 Finding the right topic

In a very useful and [freely available guide](#), the University of North Carolina (UNC) says that an effective Policy Brief:

*“...must propose a solution to a well-defined problem that can be addressed at the level of policy. This may sound easy, but it can take a lot of work to think of a problem in a way that is open to policy action.”*

In other words, the scale and scope of a Policy Brief needs to be appropriate to the target reader. But defining this can be extremely challenging. Too big and the central points will be lost. Too small and the reader might not consider the topic to be relevant to them.

So, when thinking about what you should focus on in your Policy Brief, it's a good idea to start with the 'big picture' at the research stage. What is the overall issue or area that you're working in? From there, you can begin zooming in until you find something actionable – a specific issue that could be solved through the introduction of specific initiatives, regulations, and/or policies. That then becomes the main focus of your Policy Brief.

In the same UNC document, the authors provide the following example, and while the topic is not related to metrology, it is a useful summary of the process of finding your Policy Brief topic (highlights added for emphasis):

*“Let's say that you wanted to address children's health. This is a big issue, and **too broad to serve as the focus of a Policy Brief**, but it could serve as a starting point for research. As you begin to research studies on children's health, you might decide to zoom in on the more specific issue of childhood obesity. You'll need to consult the research further to decide what factors contribute to it in order to propose policy changes. Is it lack of exercise, nutritional deficiencies, a combination of these, or something else?*

*Choosing one or another of these issues, your brief would then zoom in even further to **specific proposals** that might include exercise initiatives, nutritional guidelines, or school lunch programs. The key is that you **define the problem and its contributing factors as specifically as possible** so that some sort of concrete policy action (at the local, state, or national level) is feasible.”*

In the MEDEA programme, Policy Brief authors were required to write briefs that fit within the UN Sustainable Development Goals (SDG) framework. In particular, the briefs needed to illustrate the relevance of measurement science to four priority SDGs for the Asia-Pacific region:

- **Health (#3):** Ensure healthy lives and promote well-being for all at all ages
- **Water (#6):** Ensure availability and sustainable management of water and sanitation for all
- **Economic growth (#8):** Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- **Industry, innovation, infrastructure (#9):** Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation



In terms of identifying a suitable topic for each brief, this list was an important starting point for participants, equivalent to the “children’s health” level mentioned in the example above. It may also be a useful starting point for you in developing your own Policy Brief. However, it’s important to note that each SDG is considered a Grand Challenge. As such, they’re much ‘too big’ to make for a compelling Policy Brief.

A tighter focus is needed.

Within each SDG is a set of 2030 targets, all of which can be found on [the UN SDG website](https://sdgs.un.org/goals/). Though more specific and smaller in scope than the Goals, even these are too broad to be the subject of an effective Policy Brief. They are the equivalent of the “issues” mentioned in the example above.

This means we need to zoom even further in to find an appropriate subject for our Policy Brief. Can we make a case for the role of metrology in an application that sits within one of those targets? Here are some specific examples that may provide inspiration.

**Target 3.9:** By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

**Possible Policy Brief topic:** Measuring trace quantities of contaminants in arable soil

**Target 6.4:** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

**Possible Policy Brief topic:** Ensuring reliability of water meters in all economies

**Target 8.2:** Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors

**Possible Policy Brief topic:** Enabling online and remote calibration for health services

**Target 9.1:** Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

**Possible Policy Brief topic:** Enhancing the resilience of global supply chains for rice



### 3.4 A Policy Brief template

In the planning stages of the MEDEA training course, members of the working group requested that a template be developed that could form the basis of all future MEDEA Policy Briefs.

Templates for policy documents can be restrictive, and may not result in the optimal outcome for your reader's needs – there truly is no 'one size fits all' solution. However, templates have their place. For example, they are a very useful way to establish a consistent 'brand' across a series of documents. In addition, laying out the structure and advising on the type and style of content with which to populate each section can be particularly helpful for authors who are new to writing Policy Briefs.

The template provided to all MEDEA Policy Brief trainees is included here. The briefs produced in this programme used this as a guide. In some cases, the final versions of the briefs had specific details (e.g. word count, number of references) that fell outside of the recommended range. While readers of this guidance document are welcome to use this template, I also encourage you to play with the format, so that you produce a Policy Brief that works best for you and for your audience.

<b>** Recommended total length: 800-1500 words **</b>	
<b>Title</b>	Up to 15 words
<b>Key messages</b>	Maximum of five, Up to 150 words in total
<b>What's the issue?</b>	Maximum of 275 words
<b>Why is this important?</b>	Maximum of 225 words
<b>The role of metrology</b>	Maximum of 300 words
<b>What should policymakers do?</b>	Maximum of 275 words
<b>Local example</b>	Maximum of 275 words
<b>References</b>	~10 references

To kick-off the training programme, each participant was invited to a brainstorm session, where they presented their proposed Policy Brief topics to the trainer and the wider working group. Once the topics had been finalised, participants were sent the template, and attended a two-hour webinar, where each section of the template was discussed in detail.

For 14 weeks following the webinar, participants received weekly lessons by email. These emails provided further information on the type of content that should be included in each section, and guided them through the process of producing their first draft. Participants also had access to one-to-one meetings with the trainer, and attended several group meetings where drafts were discussed and reviewed. What follows is a combination of the guidance provided via the webinar, weekly lessons, and individual training sessions.

## 3.5 The template in detail

Before we delve into considerable detail on what to include in each section of your metrology Policy Brief, I wanted to remind you of this: **If you think about the needs and motivations of your reader at all times, and centre those in all of your decision-making, you're sure to produce a good Policy Brief.**

This approach to writing takes a lot of practice – it's not something that results from a natural aptitude. The more time and effort you put into this sort of work, the better your documents will be, and the easier writing will feel.

### 3.5.1 Title

Up to 15 words

As with the Case Studies of Chapter 2, the title of a Policy Brief is very often the last thing I finalise. I like to start with a draft title; a short sentence that clearly explains – to myself and my colleagues – what the Policy Brief is about. It's only much later, after I've started developing the Key Messages, that I begin to think about options for a title that will appeal to my reader.

Titles can be longer in a Policy Brief than in a Case Study, and there's less pressure to make them eye-catching or playful. They can be somewhat more formal or technical, but not so much so that they alienate your reader. Simple, everyday language should be prioritised where possible.

Avoid the use of any standards, ISO numbers or committee names in the title, as your reader is unlikely to be familiar with them.

#### Title Examples

Here are examples from three MEDEA Policy Briefs. Links to each are included in Section 3.7.

- ✕ Strengthening Food Safety Measures through Participation in Proficiency Testing Schemes
- ✕ Pre-Packaged Goods: Regulations, Rationale and Potential Economic Benefits
- ✕ The economic impact of error in rice moisture measurement

### 3.5.2 Key Messages

Maximum of 5, up to 150 words in total

This is – in my opinion – the most important section of the Policy Brief, and so, I've included a lot of information below. Key Messages are usually described as the essential takeaways; the 'elevator pitch' to your reader (who remember, is a time-poor policymaker).

I like to think of them as the foundations on which you'll build your Policy Brief 'house'. They define the shape of the rest of the document, and provide support for everything. As such, Key Messages should be the very **first** thing you focus on, and the part you work hardest to finesse.

Key Messages are used in many contexts, including talks and presentations, business pitches, Case Studies, and of course, Policy Briefs. The reason they are so popular is because they help counteract an unfortunate reality: No matter how well-written or comprehensive a document is, or how engaged and interested a reader might be, its detail will be forgotten. Only a small proportion of the content stays with the reader. So, a writer's ultimate goal is to craft that central content and make it as memorable as possible. And part of

that is developing Key Messages that are truly ‘sticky’ – so clear and concise, they cut through the rest of the detail, and communicate the truly important aspects of the document.

Unlike in a Case Study, where Key Messages are somewhat buried within the body text, Key Messages feature front-and-centre in a Policy Brief. They typically appear at the beginning of the document, highlighted and in their own section, to emphasise their importance. I generally recommend presenting them as a **bulleted list** of sentences, to make them easy to scan. The sentences themselves should be fairly short; you’ll have lots of space in the rest of the brief to expand on them.

While it is tempting to include a long list of Key Messages in your document, my advice is to stick to a small number: **between three and five**. Any more than that, and their impact is diluted, which somewhat defeats their purpose.

### How to begin

Writing effective Key Messages is harder than it looks and involves a lot of trial-and-error. When starting to work on yours, ask yourself this question:

**What are the top-level concepts or essential ideas that you want your reader to take away from your document?**

These will ultimately be your Key Messages. This process is iterative, though. The exact form of your Key Messages will likely change as you write – and later edit – your document, but the central ideas in them should remain the same. If not, then they’re not truly your Key Messages.

Start with a longlist. Don’t aim for perfection immediately, and don’t worry about the limit of 3 – 5 Key Messages, initially. In fact, a good first step is to list out **all** of the points you’d like to cover in the Policy Brief.

One way I like to identify and develop Key Messages at the early stages is to discuss the Policy Brief with a colleague or friend. The act of *talking* about the brief, and describing what you want the document to say can often be more productive and more efficient than working alone (where you may find yourself staring at a blank page). I encourage you to try it.

### How to progress

Once you have your longlist, you can begin whittling them down to your final 5 or fewer. Even at this stage, don’t worry too much about the specific wording – you can edit that later. But by narrowing your scope, you will start to define the framework of your Policy Brief.

To do this, you’ll need to review your drafts with a critical eye. Be honest with yourself, and remember your reader as you do this. Here are some more questions to ask yourself, e.g.

- Which of these potential Key Messages will be most helpful / informative for my reader?
- Which ones are truly essential?
- Which ones can be set aside?
- Are there any areas of overlap, e.g., can two ideas be brought together to form a single Key Message?
- Are they sufficiently targeted, i.e., am I giving my reader some practical steps or takeaway messages?
- Am I providing a ‘call to action’?

And once you get down to your (≤5) Key Messages:

- Does this group of Key Messages reflect the content I plan to write in the rest of my brief?

You are likely to be an expert on the topic within your brief, which means you are well-placed to write these Key Messages. However, your reader is likely to be a policymaker, and may have no technical background or

prior knowledge of metrology. When developing this document, remember that your reader is the person you are writing for; not your metrology colleagues. A big part of successfully engaging with them will be through these Key Messages. So, it is important that you invest time in thinking about them, writing them, and selecting your final few. That effort will help produce a Policy Brief document that sticks with your reader.

Here are some examples of Key Messages, taken from two MEDEA metrology Policy Briefs. In all cases, authors repeatedly edited and rewrote their Key Messages over several stages. Links to all of the published Policy Briefs will be provided in Section 3.7.

#### Key messages

- The digital health market is booming and it is changing the way people access medical and health services.
- Digital metrology solutions enable continuous quality assurance and the safe operation of emerging digital health tools and technologies.
- Policies, regulations or legislation need to be put in place to recognise, regulate and support the development of these solutions, and their use in legal metrology.
- Governmental multi-year funding is recommended to support the development of digital metrology solutions for digital health.

#### Key messages

- Rice moisture content affects decisions in grain harvesting, drying, storage, handling and marketing.
- Metrological control and measurement traceability of rice moisture measurement should be established.
- Better regulation of rice moisture meters used in trade are needed in Malaysia.
- Measurement traceability plays a vital role in ensuring the accuracy and reliability of rice moisture measurements, which in turn impacts the quality and market value of the rice.

### 3.5.3 What's the issue?

#### Maximum of 275 words

Later in the Policy Brief, you will be asking your reader to take action.

Before we can do that, we must first help them understand the importance of the issue. So, in this section, you are setting the scene for your reader, giving them a broad overview and some key context. Really, the question you want to answer in these 200 words is *'what is the specific problem or challenge that this Policy Brief is responding to?'*

This section should act as an introduction to the topic, and like most of the Policy Brief, have a global or regional focus. You can apply a more focused (national or economy-level) lens later, but keep this section big and broad. There is no need to name your own institute at this point. The language should be kept free of jargon, with any acronyms clearly explained. If your Policy Brief needs to fit within the SDG framework, this section would be a good place to mention that.

When considering what to include in this section, think deeply about the background information that you'd like your reader to have. What information would a non-specialist need to enter your world? What central facts and figures would help them understand why you've decided to write a Policy Brief on this topic? What data would make them care about your topic?

Relevant statistics and graphics can be a useful addition to this section – when used correctly, they can help to paint a comprehensive picture for your reader.

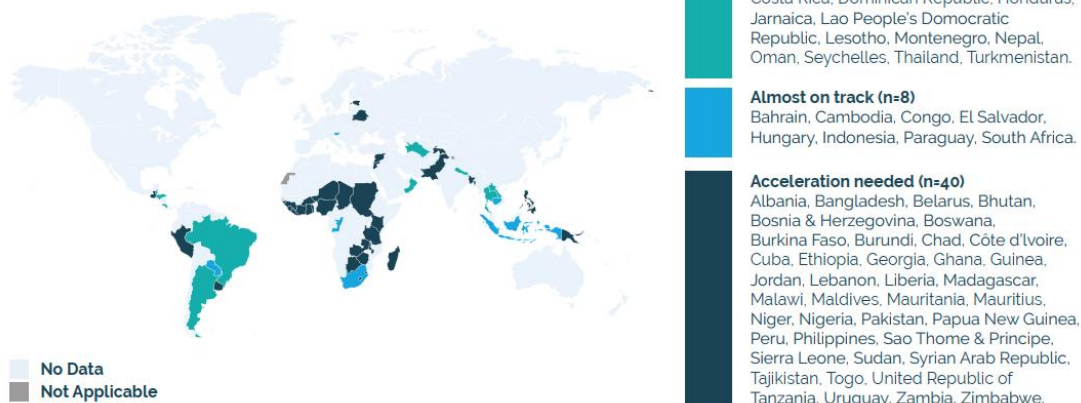
Below is an example from a MEDEA Policy Brief, which again, will be linked in Section 3.7. The author of this brief used 193 words plus a graphic to set the scene for the reader.

### What's the issue?

Without access to clean water, humanity cannot thrive. Water is indispensable for all life forms; central to every ecosystem on Earth. The United Nations identified the need for "Clean Water and Sanitation" as Goal 6 of the Sustainable Development Goals.<sup>1</sup> Within that goal, the UN identified eight specific targets. Achieving the first four of these relies on reliable and accurate measurement of water quality and quantity, such as indicator 6.1.1 which focuses on safely managed drinking water services. Unfortunately, according to the 2022 Sustainable Development Report, achieving those indicators remains a major challenge in many countries in the Asia-Pacific region.<sup>2</sup>

For example, China, India, Indonesia, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, and Vietnam share a common issue – too little of their anthropogenic wastewater is treated for reuse. In addition, a number of countries such as India, Sri Lanka, and Pakistan still lack clean water for basic consumption. The 2022 Global Analysis and Assessment of Sanitation and Drinking-Water from UN-Water states that "while 45 % of countries are on track to achieve their national drinking-water coverage (SDG) targets, only 25% of countries are on track to achieve their national sanitation coverage targets" (Figure 1).<sup>3</sup>

Figure 1: Status of progress needed to reach national sanitation coverage targets (from GLAAS Report, page 19)



### 3.5.4 Why is this important?

#### Maximum of 225 words

This section should discuss the current status of the issue you're focusing on, and where you highlight the urgency of your issue. The question it should try to answer is why are we talking about this **now**? Additional questions you might want to consider is what has changed recently or what will change in the near future? What current 'bottleneck' are we looking to overcome?

All of these questions are related to *time*. A Policy Brief is not meant to report on previous projects, or to act as a historical overview of an entire field. It is designed to be current; a document written at a particular time, to reflect (and report on) a challenge that exists at that time. This differs from Case Studies, which are documents designed to talk about a successful piece of work that was done in the past.

This and the previous section have a lot in common. Together they set the tone for the document. They give the reader the context needed to explore your topic, and they demonstrate the importance and relevance of your chosen topic to the wider world. Unlike the sections that will follow later, these two don't offer solutions or actions – they're all about providing information.

Statistics, data, and graphics are again very useful. You might even want to include an infographic. 'Visual' data of any kind should be kept very simple – remember your reader is a policymaker, not a metrologist.

As before, we want to keep the language simple and the scope broad. Note that at ~225 words, this is a slightly shorter section than the previous one.



Below is an example of this section from a MEDEA Policy Brief. The author of this brief used 180 words.

### Why is this important?

Patient safety is of utmost importance. Medical and healthcare instruments used for diagnostics and treatments must be calibrated and validated frequently and periodically to catch any potential error as early as possible. Digital health products and services are no exception to this. It is vital to ensure that (1) their performance is evaluated regularly, (2) their quality achieves established standards, and (3) they provide measurement traceability.

With wearable or portable devices and sophisticated software becoming the norm in digital health, traditional hardware-oriented metrology, carried out through lab-based calibration and verification, is no longer suitable for meeting the needs of the industry.

Dedicated digital metrology solutions, such as remote and automated calibration, AI calibration and verification, and metrology big data techniques, are better suited to support this growing sector.

However, such digital metrology solutions may not yet be recognised by regulators, or fit within their domestic legal metrology framework. So, in order to support the growth of the digital health sector, it is important to revisit existing policies, and to develop new policies around new or revised digital metrology solutions.

## 3.5.5 The role of metrology

### Maximum of 300

This will likely be the longest section of a metrology Policy Brief. Here is where you emphasise just how important metrology is throughout the world, and talk about the role that metrology can help to tackle the challenge or solve the issue you highlighted in the previous sections.

Be specific! Until now, much of your Policy Brief has been focused on providing broad context and background information. Here you begin to get more tightly focused. So don't be afraid to delve into the details of your metrology-based solution.

Rather than see this section's considerable word count as an opportunity to add lots more information, I encourage you instead to use it to clarify and add depth to your Key Messages.

It is ok to use technical or specialist terms in this section, so long as you are able to succinctly explain them to a non-expert. Your reader is unlikely to be a metrologist, so when writing Policy Briefs, the approach I like to take is to think of myself as a helpful guide. That means giving the reader enough information to understand the main points, but not so much that they become overwhelmed or lost. The next section is where we will encourage the reader to take action, so it is important that we keep them engaged and interested in the document to that point.

This is also a great section for you to highlight international links and collaborations – again, this is an opportunity to remind the reader that metrology is a global endeavour. It is relevant beyond borders, and as such, the challenges it can tackle are relevant to people all over the world. The goal of this section is to show the reader that metrology can help...and (in many cases) is already helping to solve specific issues. I encourage you to be boastful.

It's also ok in this section to mention work done by specific institutes, but remember, a Policy Brief is a call to action focused on a specific reader (a policymaker). They are unlikely to be interested in an organisational chart or knowledgeable on the specifics of a funding round, or the operations of working groups. They're looking to understand and appreciate how and why metrology will help to solve the issue laid out earlier in the document.

### 3.5.6 What should policymakers do?

Maximum of 275 words

We're almost there! This is the final section of the core Policy Brief, and arguably, the part your target reader is likely to be most invested in. So, what's needed?

As mentioned earlier, an effective Policy Brief is one that should *"propose a solution to a well-defined problem that can be addressed at the level of policy."* If you haven't been involved in policy conversations before, this may feel daunting. But in reality, the goal of this section is to give your reader recommendations for steps they could take to meet the challenge you identified in the document. Think of this as a 'Call to action'. Lay out some **specific** things a policymaker could do to help. What are the gaps that they could fill?

For example, could they:

- Advise government on the need for better standards in electricity meters
- Establish clear rules for quality, accessibility, interoperability and safety of data
- Contribute to building a robust regulatory framework for nanomaterials, based on international best practice
- Support the establishment of regulatory limits for polycyclic aromatic hydrocarbons in the environment
- Establish regulations and guidelines for the use of calibrated moisture meters that meet existing international standards
- Secure an increase in metrology funding to support key industries (e.g. training opportunities for future metrologists, or the construction new lab facilities)

Be as specific as possible in your asks, and where you can, make your recommendations relevant to our everyday lives. Talk about society, people, community – put your call to action into a context that anyone can understand. Say, for example, your Policy Brief is focused on reducing water usage. One of your suggestions might be to subsidise providers who offer rewards for customers (like, pricing discounts) who use less water. To give it context you could say, e.g., *if everyone reduced their daily usage by 5-10%, this could save the city XXX litres of water a year, and put \$X back into the customer's pockets.*

Remember, a lot of policy decisions aren't made by the politicians who appear in the media. Very often, the real power to implement new ideas lies or to shift funding focus lies with people further down the chain of command – i.e., with purpose-driven, career civil servants and policymakers. These are the people you are speaking to in this section. If you can convince them that metrology needs policy-level support, you're one step closer to making that happen.

One thing that I've heard from several policy experts is that scientists or other specialists go into discussions with the mindset that policy can be decided *entirely* based on scientific principles, and therefore, all that is needed in cases of controversy or confusion is clearer, better evidence. In reality, the evidence is only one element of many that policymakers have to take into account.

As a UCL academic [has written](#), *"Government decisions are like a Venn diagram where policy lies at the intersection of evidence, politics (including values and ideology) and delivery (the practicalities of actually doing it)."* So, when you're thinking about your recommendations for this section, bear all this in mind. It's not just about data – it's also about wider societal values, and the logistics of making a policy change happen.

Most new Policy Brief authors find this section challenging section to write, so don't be disheartened if you struggle. There are a number of documents freely available online that offer advice to experts from a range

of disciplines who want to influence policy. Below are a few examples that may prove to be useful references from you (beyond this process, too)

- (2019) 5 Tips for Communicating Research to Policy Makers <https://www.wiley.com/en-us/network/publishing/research-publishing/promoting-your-article/5-tips-for-communicating-research-to-policy-makers>
- (2017) Cairney, P., Kwiatkowski, R. How to communicate effectively with policymakers: combine insights from psychology and policy studies. *Palgrave Comm.* 3, 37 (2017). DOI: 10.1057/s41599-017-0046-8 <https://www.nature.com/articles/s41599-017-0046-8>
- (2020) Providing science advice to policy makers during COVID-19 [https://www.oecd.org/en/publications/2020/05/providing-science-advice-to-policy-makers-during-covid-19\\_9f077303.html](https://www.oecd.org/en/publications/2020/05/providing-science-advice-to-policy-makers-during-covid-19_9f077303.html)
- (2021) *Front. Res. Metr. Anal., Sec. Research Policy and Strategic Management*, Vol. 6, DOI: 10.3389/frma.2021.654191 <https://www.frontiersin.org/journals/research-metrics-and-analytics/articles/10.3389/frma.2021.654191/full>
- (2018) British Ecological Society, Top 10 tips for engaging and communicating with policy makers [https://www.gla.ac.uk/media/Media\\_735085\\_smx.pdf](https://www.gla.ac.uk/media/Media_735085_smx.pdf)

### 3.5.7 Local example

**Maximum of 275 words**

This section is a recommended 'extra' for your Policy Brief. The document should be fully coherent without this, but adding it gives you an opportunity to tell a related but standalone story.

Remember that the majority of your MEDEA Policy Brief should be internationally (or at least, nationally) relevant. This approach helps to emphasise just how global a pursuit metrology is. However, it can be very useful for your reader to get a more localised look at a topic, and for the author to speak about their organisation or a prior project related to the topic. That's what this section offers.

Here the goal is to draw a clear, straight line between metrology and societal impact. There are two examples from MEDEA Policy Briefs below.

#### Local example: Thailand

Thailand is a major producer and exporter of rice on the global market, yielding 20 million tonnes of rice in the financial year 2022-23; a 2% increase over 2021-22.<sup>3</sup>

In Thailand, every 1% of rice moisture content beyond the agreed limit (15% MC) equates to a 1.5 % drop in the price per ton. Based on the country's most recent figures, that could mean a loss of about 120 million USD/year to the economy.<sup>2</sup> The Central Bureau of Weights and Measures (CBWM) established metrological control of rice moisture measurement in 2001.<sup>5</sup>

In 2004, they issued a ministerial regulation based on OIML R 59:1984, an international standard focused on moisture measurement in cereal grains and oilseeds.<sup>6</sup> This regulation states that rice moisture meters used for commercial transactions should be verified by Weights and Measures Officers every two years. During this period, officers can inspect rice moisture meters to be used in the marketplaces to determine whether their accuracy still complies with the regulation. Rice moisture meters that fail their inspection are prohibited from use until repaired and re-verified.

The Thai CBWM subsequently established a traceability system, calibration standards, and verification and inspection processes for rice moisture meters (Fig.1). Between 2017 and 2023, approximately 2,600 units of moisture meters were verified, which suggests that people working in Thailand's rice industry have an awareness of the importance of rice moisture measurement in trading.

In addition, manipulation of moisture meters in rice trading in Thailand decreased by 50% in two years, between 2021 to 2023.<sup>7</sup> This highlights the importance of good governance of legal metrological control in preventing fraud and protecting consumers from being deceived by inaccurate measurements. Metrological control promotes fair trade practices, enhances market confidence, and contributes to the overall quality assurance of rice.



### Local example: Philippines

The Philippines is a developing country strategically located in Southeast Asia, surrounded by a vast maritime territory and known for its busy shipping routes.<sup>14</sup> Throughout history, the Philippines has seen a number of devastating oil spills.<sup>15</sup> A recent one was on February 28, 2023, when a motor tanker called MT Princess Empress carrying 900,000 litres of industrial fuel sank off Najuan, Oriental Mindoro. The oil spill caused extensive damage to the environment, estimated at around 7 billion pesos (US\$18 million).

As the country's oil spill monitoring agency, the Bureau of Fisheries and Aquatic Resources (BFAR) conducted analysis of samples from the area, measuring PAHs levels, including those of BaP. They detected low but elevated levels of PAHs in fish samples, and as a result, introduced temporary fishing bans in the affected areas. This affected the livelihood of more than 19,000 fisherfolk and their families.<sup>16, 17, 18</sup> In times like these, real-time, accurate and precise measurements of PAHs in aquatic species is crucial for ensuring livelihoods, food safety, and the health of citizens. Proper monitoring helps regulatory bodies to identify and enforce regulations in areas that may pose public health risks.

## 3.5.8 References

In all forms of writing, it is good practice to keep a record of any references or source documents used in the preparation of the final text.

Anyone experienced in academic writing – e.g. producing research papers for peer-review journals – will be very familiar with citing and referencing other papers. While we don't need to apply *quite* a much academic rigour for more public-friendly documents such as Policy Briefs, it is still vitally important that we show our sources.

For example, any specific statistics or data that you've included in your document should be referenced. Any citations to previous studies should also appear in the references section.

For the benefit of your reader, it is a good idea to keep the references section relatively short. For the MEDEA Policy briefs, I recommended staying below 10 references. However, some authors included close to 20. Choosing to include more references will, of course, make your document longer, but it may also make it more comprehensive. Whatever route you choose, make sure that the references you're including are genuinely useful.

MEDEA authors used superscript numbers within the main body of the text to cite their sources, and then listed full references with hyperlinks in a dedicated section at the end of the document. Here is an example of the References section from one MEDEA Policy Brief.

### References

- 1 Cauich-Kau, D., Rde, T.R., Cardona-Benavides, A. et al. "Natural occurrence and controls of arsenic in groundwater in a semiarid basin in the Mexican Altiplano." *Hydrogeol J* 30, 2459–2477 (2022). <https://doi.org/10.1007/s10040-022-02562-w>
- 2 E.Shajia, M.Santosh,K.V.Sarath, et.al, "Arsenic contamination of groundwater: A global synopsis with focus on the Indian Peninsula", *Geoscience Frontiers* 2021; 12(101079). <https://www.sciencedirect.com/science/article/pii/S1674987120302115#ab0015>
- 3 Joel Podgorski and Michael Berg, "Global threat of arsenic in groundwater", *Science* 2020 May 22;368(6493):845-850. doi: 10.1126/science.aba1510
- 4 World Health Organization, "Guidelines for drinking-water quality: fourth edition incorporating the first and second addenda" (2022) <https://www.who.int/publications/i/item/9789240045064>
- 5 Kianoush Khosravi-Darani, "Arsenic Exposure via Contaminated Water and Food Sources", *Water* (2022) 14(12) 1884. <https://www.mdpi.com/2073-4441/14/12/1884>
- 6 Abhijnan Bhat, Tony O Hara, Furong Tian, and Baljit Singh, "Review of analytical techniques for arsenic detection and determination in drinking water", *Environmental Science Advances* 2023;2:171-195. doi: 10.1039/D2VA00218C
- 7 Abhijnan Bhat, Tony O Hara, Furong Tian, and Baljit Singh, "Review of analytical techniques for arsenic detection and determination in drinking water", *Environmental Science Advances* 2023;2:171-195. doi: 10.1039/D2VA00218C
- 8 The World Health Organization Report on Arsenic. <https://www.who.int/news-room/fact-sheets/detail/arsenic>

Clickable hyperlinks are very useful for online-only Policy Briefs, but best practice is including full description of the reference for anyone reading a printed version of your document. By adding the author names and full title of each reference, you're also giving it your document more longevity online. If the URL of a reference is incorrect or becomes obsolete after your Policy Brief has been published, interested readers should still be able to find it via a simple internet search.

### 3.5.9 Bonus content

As a final – optional – step, I recommend writing a short summary (of less than 80 words) of the Policy Brief. This can be used when sharing the document on a website. You could also challenge yourself to write an even shorter summary (of less than 40 words) too. This 'top-line' summary may be particularly useful for sharing your document on social media channels such as Bluesky or Twitter. It also tells a prospective reader, at a glance, what the likely contents of the document are.

Two real-world examples are included below, and in Section 3.7, you'll find the top-line summaries for all nine MEDEA Policy Briefs:

- **Policy Brief title:** Digital Metrology for Digital Health

**Link:** <https://metrologyasiapacific.com/metrology-resources/digital-metrology-for-digital-health/>

**<80-word summary:** Digital health is transforming the healthcare sector and our lives, particularly in addressing the challenges of ageing populations, workforce shortages in healthcare, and pandemics. In this Policy Brief, learn more about digital health and the role that metrology will play in its future. Guidance and suggestions for policymakers are included, as well as an impactful example from Singapore.

**Top-line summary:** Digital health is transforming the healthcare sector and our lives. What role can metrologists - and policymakers - play in meeting our digital future?

- **Policy Brief title:** Enhancing Water Quality in Rural India: Use of Locally-Made Reference Materials for Effective Monitoring

**Link:** <https://metrologyasiapacific.com/metrology-resources/enhancing-water-quality-in-rural-india-use-of-locally-made-reference-materials-for-effective-monitoring/>

**<80-word summary:** Access to safe and clean drinking water is a fundamental human right, but this right remains a distant dream for millions living in remote rural areas of India. Non-standardized methods for sampling, extraction, purification, identification, and quantification of microplastics have created uncertainties about data quality. In this Policy Brief document, learn about an ambitious clean water scheme from the Indian Government, and discover eight actions that policymakers can take to improve water quality where they are.

**Top-line summary:** Rural areas struggle to access clean, safe water. This brief presents an ambitious scheme to change this in India, and makes suggestions to policymakers on steps they can take.

## 3.6 Publishing your Policy Brief

Early on in the development of the MEDEA Policy Briefs, a decision was taken to employ a professional graphic designer to give the documents a clearly-defined 'brand identity'. To that end, we worked with New Zealand-based [Studio C Design](#). Studio C helped us to choose a colour palette, font style and size, and document layout. Where new visuals such as a data charts or infographics were needed, these were created by the graphic designer, or occasionally adapted from existing sources. The development process itself was very positive, and the outputs (the final policy briefs) are exactly what we'd hoped to achieve. So, if you have the option to work with graphic designers, I recommend it. However, if that's outside of your budget, do not worry. It is still possible to create a visually appealing Policy Brief without the help of a designer. **Section 2.5.6** includes suggestions for tools and websites that can help you level up your document.

We also tried to ensure that any data included in MEDEA Policy Briefs be publicly-available, and used [open data](#) where possible. We also chose to make the Policy Briefs free to download from a public website, and published them in a very common, but non-editable format (e.g. PDF) to make them as accessible as possible. You may wish to 'hide' them behind a virtual barrier, e.g., require people to add their email address before they can download a file. If your goal is to have people read your Policy Brief, I generally suggest keeping barriers low to non-existent.

However, you may need to consult with colleagues as to what the appropriate copyright protections are for your document. Many organisations have their own policies, so I encourage you to check them.

## 3.7 Example Policy Briefs from the world of metrology

The following nine Policy Briefs were produced by participants of the MEDEA training course, and can be found on the [Metrology Asia Pacific website](#). All largely follow the recommended template.

1. **Digital Metrology for Digital Health** ([link](#))

*Top-line summary: Digital health is transforming the healthcare sector and our lives. What role can metrologists - and policymakers - play in meeting our digital future?*

2. **Pre-Packaged Goods: Regulations, Rationale and Potential Economic Benefits** ([link](#))

*Top-line summary: The trade of goods has increasingly moved from commodities sold in bulk forms to pre-packaged goods. How has the role of metrology - and trade policy - changed as a result?*

3. **Reliable measurement of water quality for human health** ([link](#))

*Top-line summary: Providing access to clean water in the Asia-Pacific region is a growing challenge. How can policymakers help?*

4. **Addressing Arsenic Contamination: Ensuring Safe Drinking Water and Enhancing Laboratory Testing** ([link](#))

*Top-line summary: Arsenic, present at elevated levels in groundwater, puts millions of people at risk. This document is a primer for policymakers on the scale of the issue, and urges action for clean water.*

5. **The economic impact of error in rice moisture measurement** ([link](#))

*Top-line summary: Rice is a global staple food, and the careful management of it has an impact on international trade. Here's what policymakers need to know about rice moisture measurement.*

6. **Nanometrology: An Emerging Priority for the Asia-Pacific Region** ([link](#))

*Top-line summary: Nanomaterials are finding applications in an ever-growing number of sectors across the Asia-Pacific region. How can metrologists and policymakers work together to ensure this happens safely?*

7. **Organic Contaminants in Food: A Global Concern and a Measurement Challenge** ([link](#))

*Top-line summary: Hazardous compounds are finding their way into our diet. How can metrology help, and what role should policymakers play in securing our food future?*

8. **Enhancing Water Quality in Rural India: Use of Locally-Made Reference Materials for Effective Monitoring** ([link](#))

*Top-line summary: Rural areas struggle to access clean, safe water. This brief presents an ambitious scheme to change this in India, and makes suggestions to policymakers on steps they can take.*

9. **Strengthening Food Safety Measures through Participation in Proficiency Testing Schemes** ([link](#))

*Top-line summary: Local testing laboratories are vital in the battle to keep our food safe-to-eat. Policymakers are encouraged to invest in proficiency testing schemes for these labs.*

In terms of other English-language examples from metrology institutes:

- The UK's **National Physical Laboratory (NPL)** does not produce policy briefings that mirror the format referenced in this report. However, it produces briefing documents on a range of topics for the [Parliamentary Office of Science and Technology](#), and regularly responds to specific queries from UK policymakers and government representatives. For all of NPL's *Informing Policy* content, visit this page: <https://www.npl.co.uk/government/informing-policy>
- The home of metrology in the US – **the National Institute of Standards and Technology (NIST)** – also regularly advises policymakers, and they have a dedicated [policy office](#). However, I could not find anything that resembled the sort of Policy Briefs referenced in this document or in the associated training course.
- Personal correspondence with **National Measurement Institute Australia (NMIA)** confirmed that the development of metrology Policy Briefs is an area of interest for them, but as yet, no such documents exist online.

## Chapter 4:

# Takeaways & Appendices

## 4.1 Takeaways

If you take anything away from this document, I hope it is that, with time and practice, anyone can produce excellent documents suitable for a wide range of audiences.

Keeping your target audience as the heart of your writing – by telling them what they *need* to know rather than what you would *like* to tell them – will ensure that your document is effective.

The entire process of writing is easier with help, so I encourage you to reach out to colleagues and friends who may be willing to brainstorm with you and review early drafts. Participants mentioned how useful they found it to have a peer working on their own Policy Brief at the same time – they shared ideas and held each other accountable throughout. If this is an option for you, take it!

And most of all: keep writing, and keep reading, so that you can learn from what others have done.

For final takeaway messages, I want to hand over to the participants of the online training courses that informed this document. They were asked to provide feedback using an anonymous form. Here are some of the responses.

### **Did you learn anything new on this course? If so, what was it?**

- Yes, we learned to look from reader's perspective while writing
- Yes, everything! I had a different approach to writing case studies before this, but this way is easier and more effective.
- Yes. I learned how to choose the key messages of a policy brief
- Yes. I learned how to create a concise and impactful scientific message.

### **What advice would you give to someone wanting to write their first Metrology Case Study or Policy Brief?**

- Think about your target audience.
- Do not assume you know how to write. Learn and have the courage to ask questions.
- Start with something you are interested in.
- Attend this training course first.
- They should give it a try! Really think of a problem that needs a solution that would benefit everyone.
- Read good policy briefs to understand the techniques used in writing them.
- Be creative
- Define your purpose, gather relevant information, structure your writing, use clear and concise language, provide supporting evidence, tailor your writing to your audience, get feedback, and proofread carefully.

## 4.2 Appendix I - Author and trainer

Laurie Winkless is a metrologist-turned-science journalist, originally from Ireland, now based in Aotearoa New Zealand. After her studies in physics and space science, she joined the UK's National Physical Laboratory where she specialised in functional materials.

Since leaving the lab, she has worked with scientific institutes, Nobel laureates, engineering companies, universities, and astronauts, amongst others. Her writing has featured in outlets including Forbes, Wired,

RNZ and The Economist. She’s spoken at events all over the world, and has appeared on some of the biggest science podcasts on offer.

Laurie has written two books, which were both published internationally by Bloomsbury. Her first was called *Science and the City*. Her second, *Sticky: The Secret Science of Surfaces*, became a bestseller, and was a finalist for the 2023 AAAS/Subaru YA prize for excellence in science books.

If you have any questions about this document, training courses, writing or science communication, I can be reached on [winkless.training@gmail.com](mailto:winkless.training@gmail.com).

## 4.3 Appendix II - Participants

Trainees on these courses came from the following institutes

National Institute of Metrology (Thailand)	Industrial Technology Research Institute (Chinese Taipei)
Mongolian Agency for Standardization and Metrology	Industrial Technology Development Institute (DOST-ITDI (Philippines)
Korea Research Institute of Standards and Science	SIRIM Berhad, formerly known as the Standard and Industrial Research Institute of Malaysia
National Institute of Metrology of China	Agency for Science, Technology and Research (A*STAR), National Metrology Centre (Singapore)
Kementerian Perdagangan Republik Indonesia	National Physical Laboratory of India
Bangladesh Standards and Testing Institution	National Metrology Center of Cambodia

## 4.4 Appendix III - Copyright

This document was produced and published in 2024. If you wish to use or distribute the material in any manner, please note that document has the following Creative Commons license:



**Attribution Non-Commercial No Derivatives 4.0 International.** All details of the terms of this license can be found [here](#).

Copyright remains with Laurie Winkless (trading as Winkless Science Storytelling), the Asia-Pacific Metrology Programme (APMP), the Asia-Pacific Metrology Programme (APLMF), and Physikalisch-Technische Bundesanstalt (PTB).