POLARIS INSIGHT

SPECIAL TOWNHALL EDITION

polaris

This edition of Polaris Insight brings you the highlights in the following- articles, each capturing a different angle of what Polaris means and where it is heading.

Polaris Insight – Special Report on the Townhall Meeting

On September 9th, the Polaris community came together in Amersfoort for a milestone event: **the first Townhall.** It was a day filled with strategic perspectives, inspiring interviews, and open dialogue across research, industry, and government.

The Townhall gathering smashed in with the Polaris film- it captures the spirit that Polaris is more.

The Townhall was more than a series of talks, it was also a moment to see and feel the energy of the Polaris community. The Polaris film captured this spirit.

With voices from across the programme, the film highlighted how inspiration and collaboration go hand in hand.

From PhD researchers to senior leaders, the message was clear: **Polaris is not just about technology, but about people coming together to achieve breakthroughs that matter.**

In One sentence: *The Townhall showed clear energy and commitment, combining inspiration and collaboration, underlining both the urgency and the need for Polaris. This day marked an important step in building momentum.*

Keynote Perspective – Peter Wennink (NGF)

As Vice-Chair of the Advisory Board of the National Growth Fund, Peter Wennink shared his view on why Polaris was selected for support and how it connects to long-term socio-economic challenges.

In conversation with Simone van Trier, Wennink explained how strategic knowledge and large-scale collaboration form the foundation for safeguarding the Netherlands' future position.

His words made clear why the Growth Fund invests €101 million in Polaris, not as a short-term project, but as an answer to challenges spanning generations.

Read the full article here.

Defence Perspective –
KTZ Olaf Binnenhei (RNLN / COMMiT)

KTZ Olaf Binnenhei opened the Townhall with urgency: defence needs are changing fast, and technology development cannot afford to lag behind.

KTZ Olaf Binnenhei, *Director of Maritime Systems at the Royal Netherlands Navy's Materieel & IT Command (COMMIT),* brought the defence perspective to the fore. With a mix of humour and urgency, he explained why Polaris is not just another research program, but a mission-critical effort for the safety of the Netherlands and its allies.

"Do I have high expectations?
***Yes.** Am I in a hurry? **Also yes.**"*

A rapidly changing threat landscape

Binnenhei outlined the strategic backdrop: global tensions, the war in Ukraine, instability in the Middle East, and technological advances that change the nature of conflict. Defence must cope with faster missiles, swarming drones, GPS interference, crowded frequency bands, and even climate effects.

"*The future battlefield is evolving rapidly, and our readiness must evolve even faster*." For the Navy, this translates into an almost complete fleet renewal in the coming decade, with the imperative to integrate new technologies at speed.

Nederland Radarland as a model ecosystem

He highlighted the **Nederland Radarland** ecosystem, the close cooperation between government, industry, and academia, as a strength that has delivered world-class radar. The shift from mechanically scanned beams to **digitally steered arrays** has created unprecedented flexibility and resilience. Polaris builds on this foundation. A tangible example is the replacement of the Navy's air defence frigates: the new radar suite will incorporate **ABWA technology**, developed within Polaris.

Good enough, on time

A recurring theme was timeliness. Binnenhei reminded the audience that engineering culture often aims for perfection, but in defence, that can be too slow. "*A solid product delivered on time is more valuable than a perfect product that arrives too late. The opponent is not waiting for us.*"

The new philosophy is to deliver baseline systems that are good enough now, and then improve continuously, with software updates and incremental upgrades, rather than waiting years for major overhauls.

A call for collaboration

Binnenhei made it clear that success will require teamwork:
"*Don't work in stovepipes. Call each other, drink coffee with each other. Teamwork is essential.*"
He also linked the work of the audience directly to the sailors at sea: "*Your efforts strengthen the security of the Netherlands and the safety of our crews.*"

Engaging with the audience

The Q&A session drew the audience into the urgency he described.

Awareness of impact. When asked if researchers realised their work directly contributes to Navy capability, several nodded. A participant from Philips reflected: "*We already know from Ukraine that technology is deployed without long testing cycles. That means we also need to catch up, and fast.*"

How good is good enough? TU/e researchers pressed him on the "8.5 versus 10.0" concept. Binnenhei responded: "*We used to wait for perfect systems and delay delivery. Now we'd rather field an 8.5 and improve through feedback. Like your phone, software updates should bring new functions overnight*."

Hardware versus software. Some worried that hardware upgrades are difficult once a ship is built. Binnenhei acknowledged this but stressed that design must allow for incremental improvements, both hardware and software, to avoid long service gaps.

European cooperation. An audience member asked about synergies with other navies. Binnenhei noted that national industry policies often complicate joint development, but underlined that Dutch radar remains world-class: "*Otherwise we would buy elsewhere*.

Human capital. TU/e and Philips participants asked about Defence's expectations. Binnenhei was clear: "*We need more people everywhere, military, civilian, academic. Please send us your students.*" He welcomed examples from Israel and the US, where Defence plays an active role in startups and internships.

Short- and long-term deliverables. UTwente raised the need for early deliverables. Binnenhei agreed: first ships may carry simpler configurations, later ones more advanced.

Dual-use technology. Asked about civilian applications, Binnenhei said: "*Dual-use makes industry stronger and more resilient. It's better for companies and better for us, as long as sensitive knowledge stays protected.*"

Closing message

Colonel Binnenhei concluded with a clear call to action:

"Deliver together, deliver fast, and keep improving. What you do in Polaris directly strengthens the security of the Netherlands and the safety of our sailors. Thank you."

Polaris Insight takeaway: The Defence perspective puts urgency, teamwork, and continuous improvement at the heart of Polaris. It is not only about technology, but about safeguarding national security in a world where time itself has become a strategic factor.

The Polaris Research Puzzle

How a compact, complementary consortium turns ambition into outcomes

Polaris began as a phone call in 2021. Four years, countless coffees, and one granted NGF proposal later, the picture is finally coming into focus. In a wide-ranging conversation with **Prof. dr. ir. Frank van Vliet** (TNO &University of Twente) and **dr. ir. Simon van den Berg** (Technical Innovation Director, Thales), moderator Simone van Trier explored how a deliberately compact, complementary consortium plans to accelerate RF innovation, across radar, MRI and telecom, while building a technical legacy that lasts beyond the program.

"In the beginning, you don't even know which puzzle you're going to lay… later the picture slowly becomes more clear."
Frank van Vliet

Why this consortium is different

Focused by design. In Growth Fund terms Polaris is "small," yet intentionally **manageable and mission-focused**. Partners were selected for **complementarity rather than competition**, enabling open exchange without the friction of direct market rivalries.

The full chain in one room.

From low-TRL university research to application-driven industry and an **end user (MoD),** Polaris spans the entire trajectory, technology push meets application pull, with clear routes to first demonstrators. "*Complementarity beats competition inside the consortium.*" **Simon van den Berg**

Governance that accelerates (not slows)

To translate ideas into progress, Polaris runs a **three-layer structure**:

1. **Technical Advisory Board (TAR)** - ~13 senior experts (one per partner). Their role is to stimulate the right interconnections between ideas, not to "gatekeep."
2. **Program Management Team** - day-to-day execution and delivery.
3. **Steering Group** - board-level direction.

The **mantra: focus**. Staying within RF integration and choosing for speed and impact is how a compact program punches above its weight.

The transversal threads

Some challenges cut across every level, from transistor to system. Over the past months, several **cross-domain** priorities crystallized:

- EM synthese
- Integrated Rx engineering
- Chip cooling technology
- Vertical stacking

Approaching these **coherently** avoids solving a "system problem" that could have been fixed more elegantly at device level (or vice versa).

Human Capital: growing integrators

Polaris aims to grow specialists who can **zoom out**, engineers fluent in their own depth **and** the language of neighboring domains. It's not about superhumans; it's about reclaiming the "**back-of-the-envelope**" instinct, the ability to estimate, trade off, and communicate across boundaries. The payoff is faster convergence to the "best overall" solution.

"Not supermen or superwomen, engineers excellent at one thing who can still see the whole."
Simon

What the breakthroughs could look like (four "what-ifs")

1. **Model GaN trapping end-to-end.**
   Translate device physics into circuit-level behavior to **shorten MMIC design** cycles and de-risk material choices.
2. **Low-cost thermal interposers**
   New materials between heat sources and cooling infrastructure to enable cooler, **more flexible packages** (e.g., Neways/Altum RF pathways).
3. **Much higher-efficiency RF power amplifiers**
   Direct system-level gains, l**ess dissipation, smaller volume, lower power budgets**, critical for next-gen radar.
4. **Ultra-low-phase-noise, coherent miniature signal generators**
   A new **MRI** paradigm with added degrees of freedom for imaging, semiconductor advances unlocking novel signal-processing strategies.

Culture: how we work from today onward

- **Connect across domains.** If you leave a Polaris gathering without meeting someone **outside your field**, you missed an opportunity.
- **Share openly, transparently.** The consortium is deliberately **non-competitive** internally to enable exactly that.
- **Deliver early, improve fast.** Where appropriate, embrace "**good-enough-now, better-later**." Urgency matters, defense needs and market pull won't wait.
- **Build legacy while delivering.** Balance near-term demonstrators with long-horizon research that seeds the **post-Polaris future**.

"Polaris is an accelerator. We need choices and focus, and we need them now."
Simon




Consortium Voice – Strategy, Urgency, and the Multiplier Effect

No programme succeeds without the active engagement of its consortium partners. At the Townhall, representatives from the Polaris Steering Committee shared both their expectations and their commitments.

The final part of the Polaris Townhall in Amersfoort brought the Steering Committee to the stage. Moderator **Simone van Trier** guided a diverse panel of leaders from industry, academia, research institutes, and regional development agencies through a conversation on the **strategic meaning of Polaris**.

The central theme was the **multiplier effect**: the idea that every euro invested in Polaris should return multiple times in research breakthroughs, ecosystem growth, and human capital. But beyond the numbers, the discussion revealed the **strategic mindset** guiding the consortium, urgency, resilience, and co-creation.

Urgency and Deliverables

From the start, the tone was clear: Europe cannot afford to move slowly. "*If Polaris wasn't here, we would have had to invent something like it ourselves*," said **Ioannis Panagiotelis (Philips).** "*We don't only want to do research, we want to deliver something with our systems in the next three years. It's imperative for us*." For the Steering Committee, the challenge is not only technological excellence, but **speed to impact**.

Autonomy in a Changing World

Several speakers pointed to the **geopolitical landscape** as a driving force. "*Local for local is the name of the policy,"* Panagiotelis warned. "*Europe risks being exposed if we don't secure autonomy in critical technologies like semiconductors, superconductors, and radiofrequency*."

Geert van der Molen (Thales) added the defence perspective:
"*We need to accelerate. Things are going very quickly in the field, and we must be ready for what we don't know yet. That's where cooperation in Polaris can help immensely*."

The Multiplier Effect in Action

The multiplier effect came alive in the examples shared. For **Bronkhorst**, the value lies in applying its **expertise** across different domains. "*It gives us the chance to talk directly with engineers and researchers, not just purchasing departments*," said **Henk Tappel**. "*This brings insight into the next level of what customers will need, and lets us contribute our buried channel technology to the consortium*."

Altum RF, one of the smaller partners, underlined the opportunity:
"*We develop high-frequency components at the base of both radar and MRI,"* said **Niels Kramer**. *"For us it is invaluable to get direct input from system integrators, and to feed our competitive components back into the ecosystem."*

For the universities, the multiplier effect is as much about people as technology.
"*Polaris is a playing field for the brightest ideas,"* said **Mark Bentum (TU/e).** *"When researchers work together, one good idea sparks ten new ones. That's how you create real breakthroughs.*"

Building a Lasting Legacy

Looking further ahead, **Guus Rijnders (University of Twente)** spoke about legacy:
"*Eight years from now, did we change our way of working? That's the real question. I hope to see universities and industry in open dialogue, with trust, common roadmaps, and actively working together. That will be the true outcome of Polaris*."

Christa Hoyer (TNO) echoed this, stressing continuity:
"*Our mission is to bridge the gap between academic results and societal value. With Polaris, we want to deliver on time, on spec, good enough first, and then grow from there. The key is to keep connecting at every level.*"

A National Perspective

Finally, the regional development agencies emphasized the nationwide character of Polaris. **Theo Föllings (Oost NL):** "*It's not just East Netherlands, we represent all regions. Our role is to bring SMEs and startups into the ecosystem, help them with business plans, and ensure technologies find dual-use applications. Only by linking regions can we build a truly national strategy.*"

Conclusion

The Steering Committee's discussion showed that Polaris is more than a research program. It is a strategic instrument for Europe's autonomy, a catalyst for **industrial and societal impact, and a multiplier of talent and ideas**.

Or as one participant summarized with quiet determination:

> ***"We must go faster, deliver sooner, and work together, because standing still is not an option."***

Contact Information
For questions or suggestions regarding the POLARIS Insight, feel free to email us at info@polaris-ngf.nl
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