



Assessment of Effectiveness of NAVISP Phase 1 & 2 and Recommendations for Phase 3

Prepared by: NAVISP Advisory Committee (NAVAC)

NAVAC members: Bernd Eissfeller, Didier Faivre, Peter Grogard, Roger McKinlay, Luis Mayo (Chair)

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Roger Mckinlay, Member



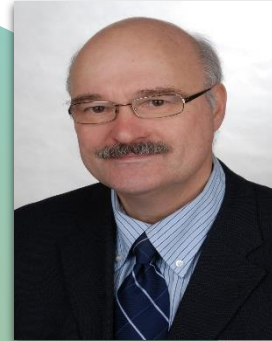
Peter Grogard, Member



Luis Mayo, Chair



Bernd Eissfeller, Member



Didier Faivre, Member

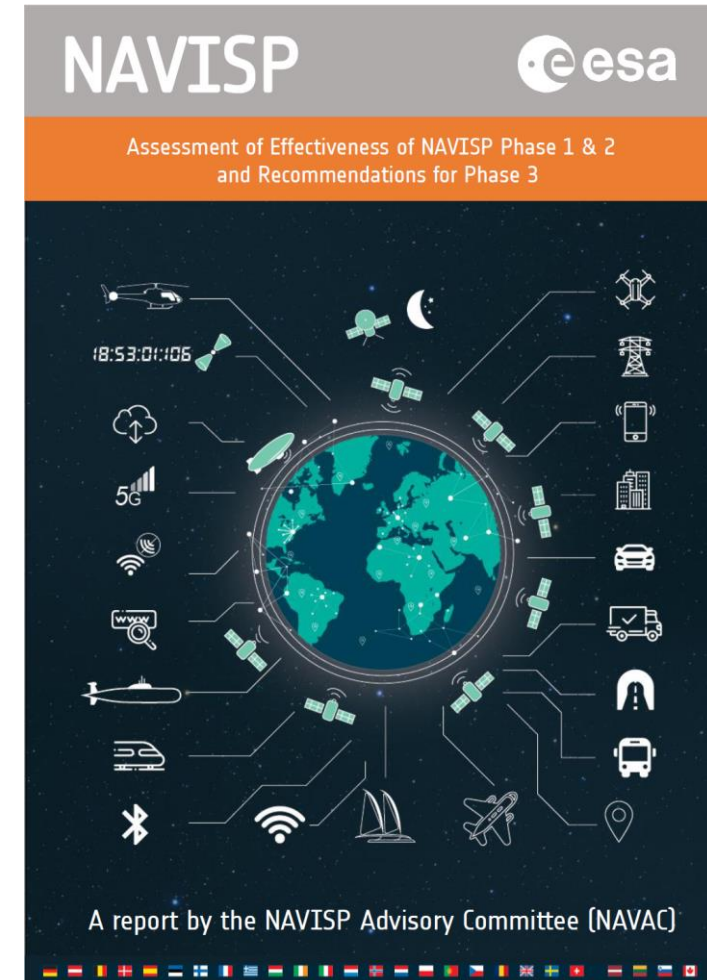




Facts and findings in the NAVAC's 2021 NAVISP Assessment Report

- Provide recommendations as to which broad areas of interest have the greatest potential for the development of NAVISP activities and how this potential may best be realized.
- Make a preliminary assessment of ideas and proposals made by the Agency on NAVISP Element 1 Workplans, in order to assist NAVISP management in setting priorities.
- Provide ad-hoc advice on the results and value of individual projects.
- **Make an overall assessment of the Programme effectiveness at the end of each phase and make recommendations for the following one.**

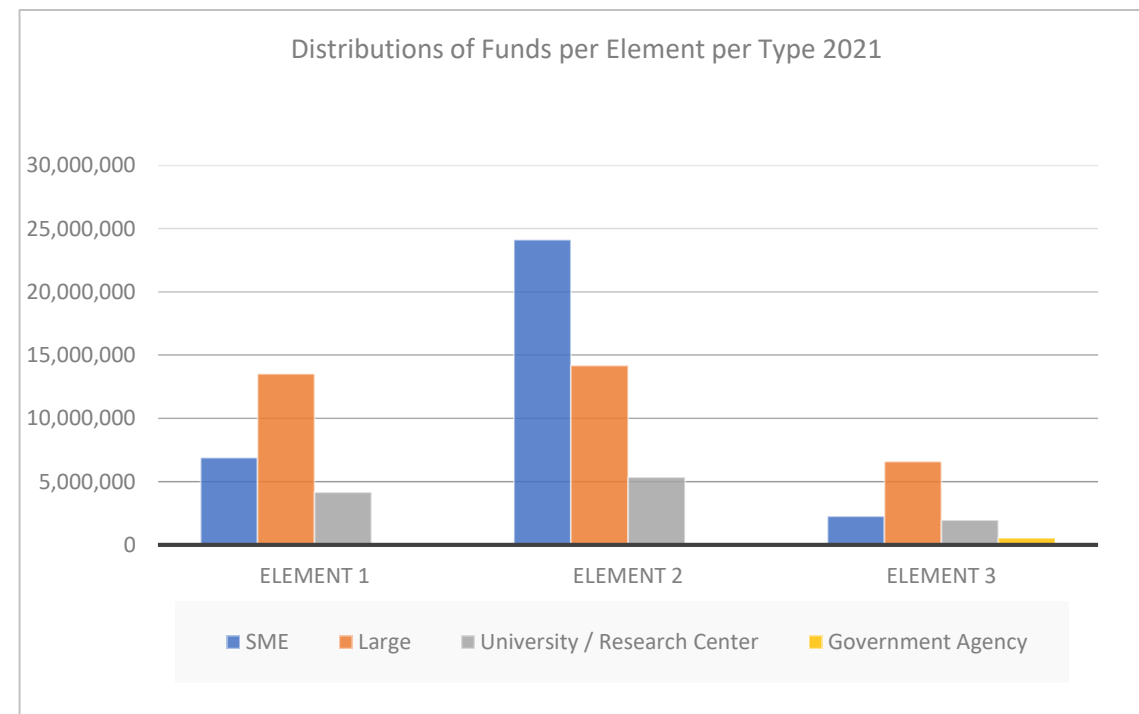
- Maintain the same approach and evaluation criteria defined in 2019 assessment, to allow traceability to previous findings and to support the analysis of performance evolution.
- Ponder the fact that the amount of data available now is considerably bigger.
- Weigh on success stories.



FACTS

By July 2021:

- NAVISP had invested around €100 million, and leveraged industry investment for over 30 additional million.
- Close to 200 activities undertaken within the three NAVISP elements.
- 46 activities completed: 21 in Element 1; 23 in Element 2; two in Element 3.
- Over 250 economic operators have participated in the programme.
- The average size of activities was roughly 500 K€ per activity in Element 1 and 800 K€ in Element 2.



KF1

The success of NAVISP has consolidated during Phase 2.

KF2

The key findings made in the NAVAC's 2019 assessment are confirmed in 2021:

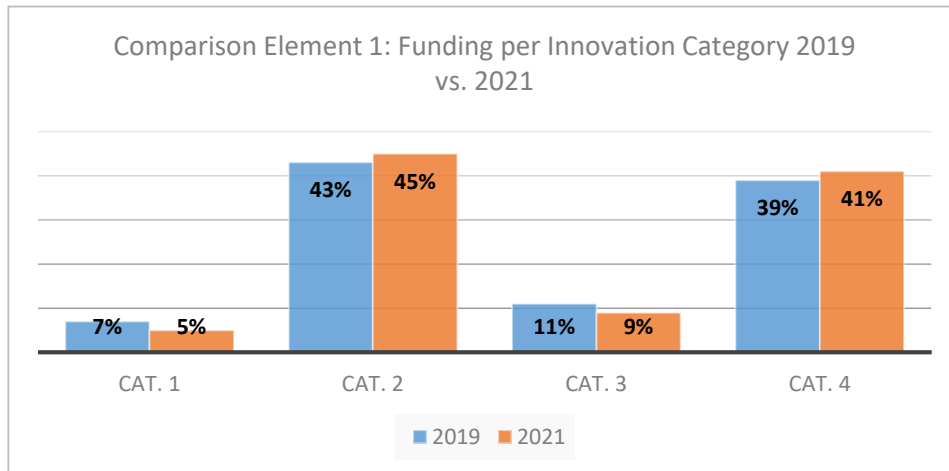
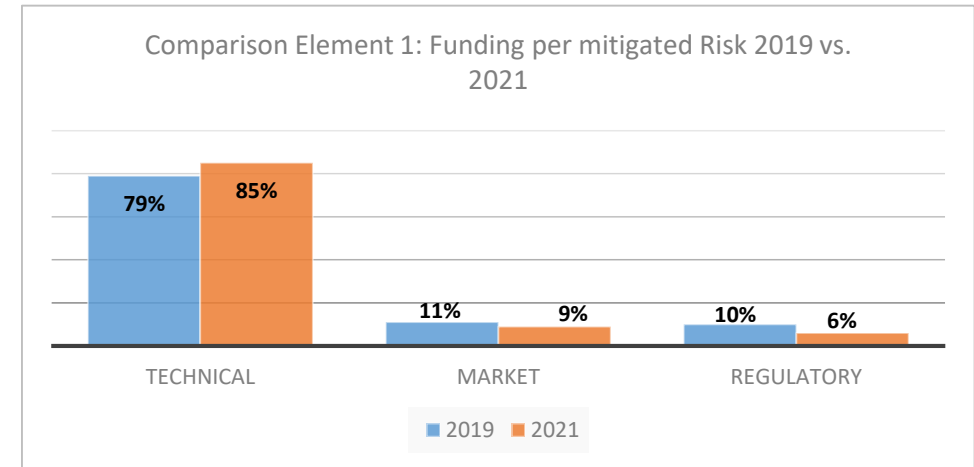
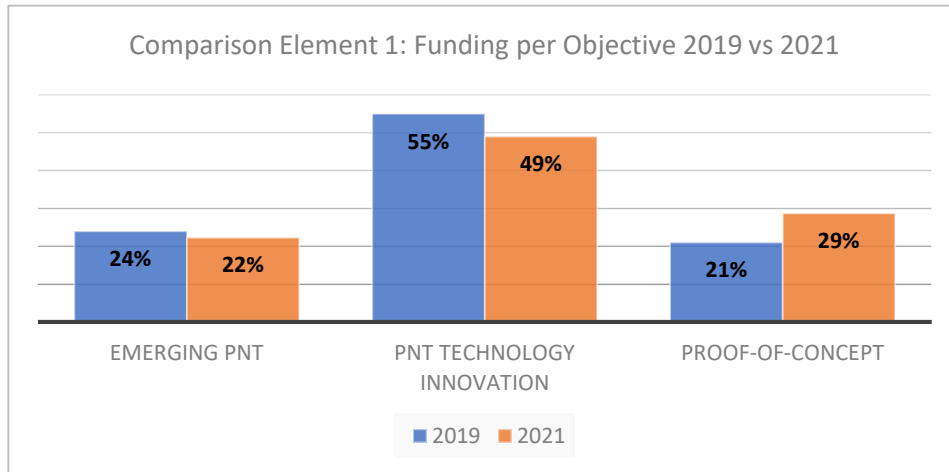
- The ambition to encourage more market-pull and less technology-push has only partially been realized.
- Large companies to be encouraged to benefit from the innovative capacity of small companies.
- Non-space system integrators still not engaged in NAVISP.
- The size of activities is still small.

Reminder: Innovation Categories

	Existing Technology	New Technology
New Market	3 *	4
Existing Market	1	2

Innovation Category			
Category	Description	Innovation Potential	Approached by NAVISP
1	Existing technology in an existing market	Low	No
2	New technology in an existing market	Medium	Yes
3	Existing technology in a new market	Medium	Yes
4	New technology in a new market	High	Yes

Element 1 evolution



Element 1 success indication:

- One activity (less than 2%) did not fully meet its objectives
- Another activity was not pursued in favor of a similar activity under preparation under another agency programme.
- Three activities (5%) were advertised as ITTs but no bids were received or the bids were not supported by the participating States.

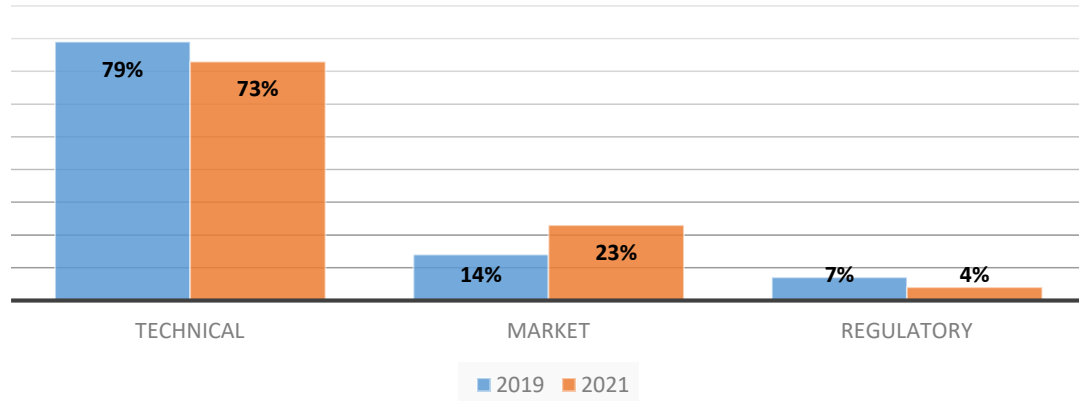
KF3

Despite efforts made in Element 1 to facilitate the transition from technology advancements to commercial products, more progress is needed on key technology development to prepare commercialization or in the reduction of regulatory risks:

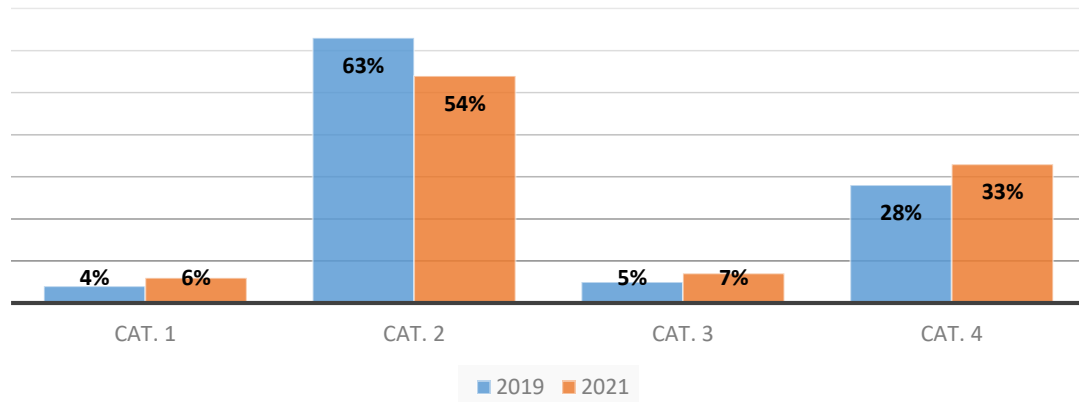
- NAVISP support to key technology developments, e.g. GNSS chips, should be strengthened including any opportunities possible within Element 1.
- Reduction of regulatory risks should receive more attention in Element 1.

Element 2 evolution

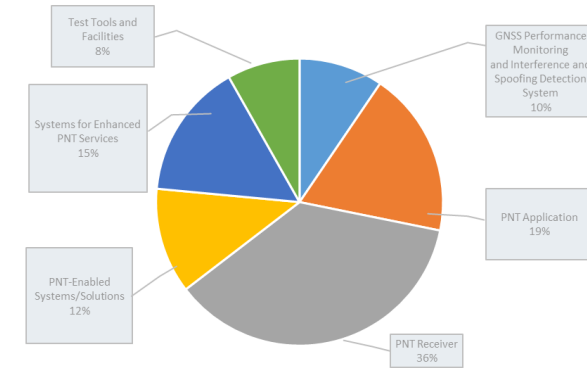
Comparison (2019 vs. 2021): Funding per Risk Area Element 2



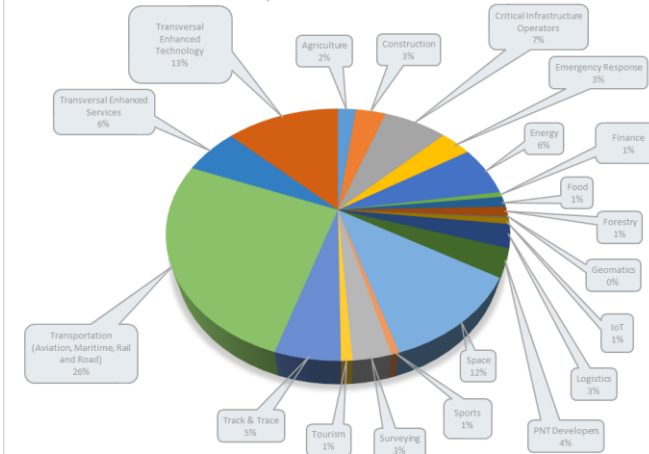
Comparison (2019 vs. 2021): Funding per Innovation Category Element 2



ESA funds per Value Chain Position



ESA Funds per Market Area



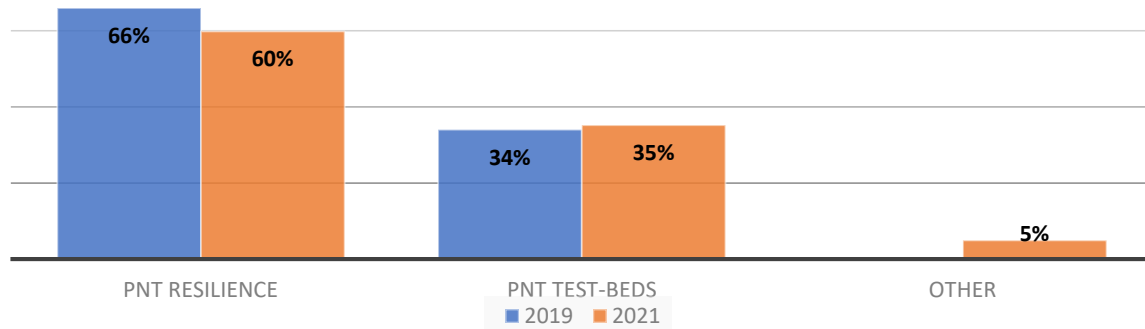
KF4

Element 2 has continued to be a very attractive element to industry, namely for technology risk reduction on their products:

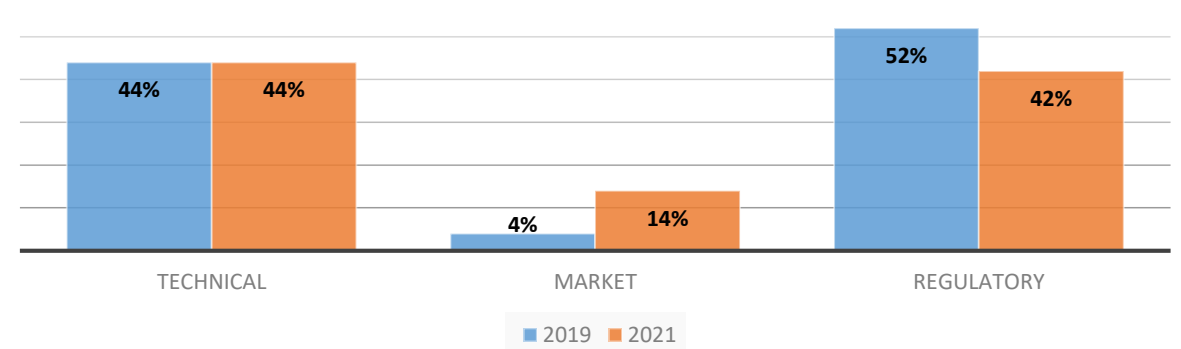
- The success of Element 2 in attracting interest of newcomers to space-enabled technology solutions should be continued and strengthened.
- NAVISP should take advantage of the new Galileo services to increase its outreach in professional markets.
- Element 2 is currently biased towards technology risk reduction while reduction of market risks is not yet fully exploited.

Element 3 evolution

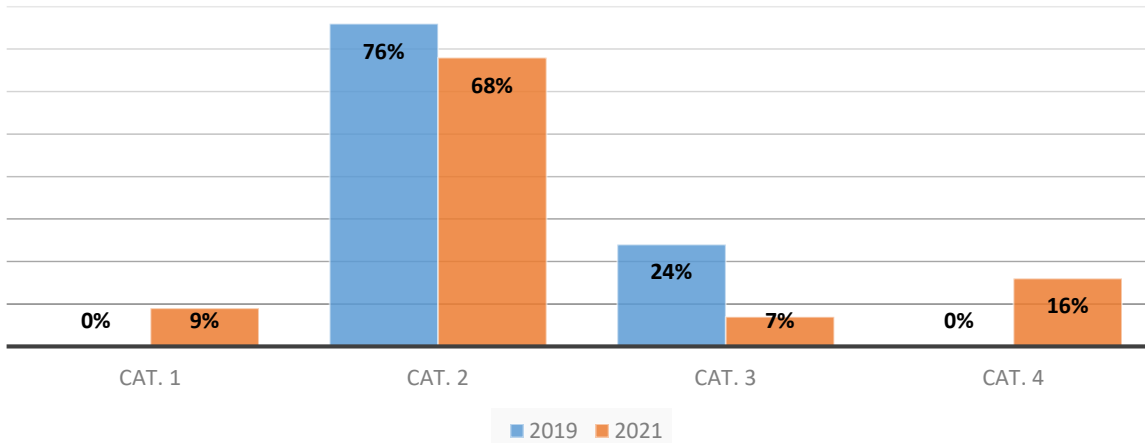
Comparison (2019 vs. 2021): Funding by Objectives Element 3



Comparison Element 3: Funding per mitigated Risk (2019 vs. 2021)



Comparison Element 3: Funding per Innovation Category (2019 vs. 2021)



- NAVAC's Element 3 assessment in 2019 only included qualitative information.

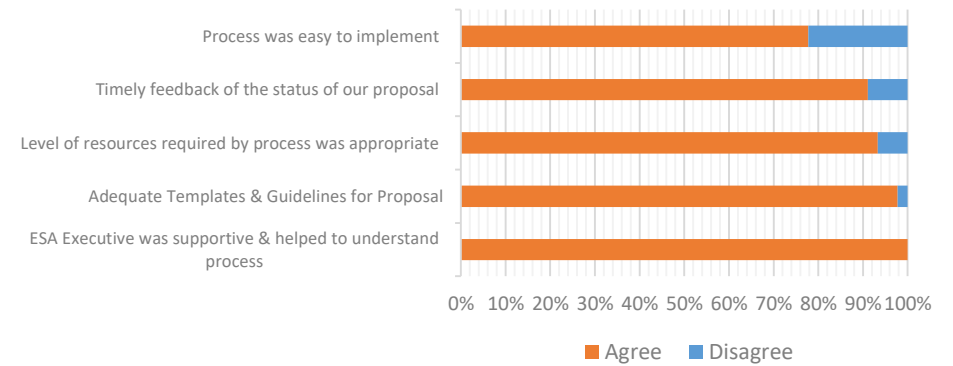
KF5

Element 3 has been successfully consolidated during Phase 2:

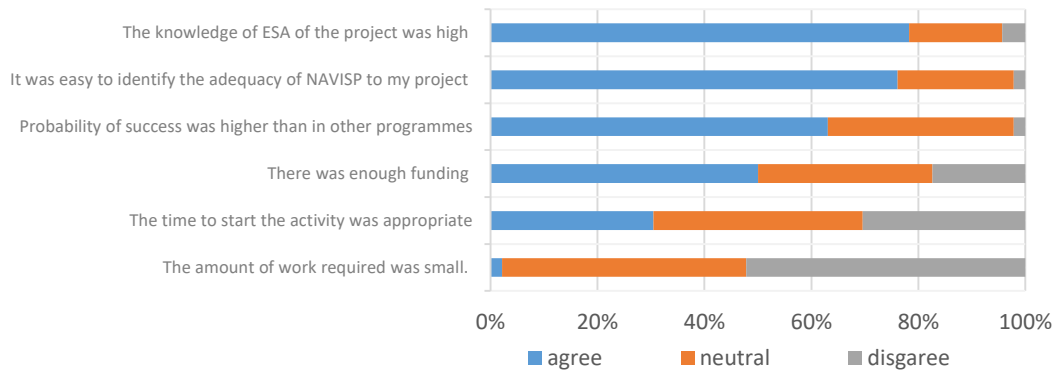
- The funding of the Element 3 has drastically increased in the second Phase of the programme.
- Element 3 distribution of funds is, broadly speaking, better aligned with the objectives of this Element.
- It may be worth exploring ways to align this Element to the specific interests of those member states that do not have significant national navigation programmes.

- Survey distributed to 80 Element 2 prime contractors.
- 50 of them (63%) responded to the survey.
- 60% where SME. The rest where large companies.

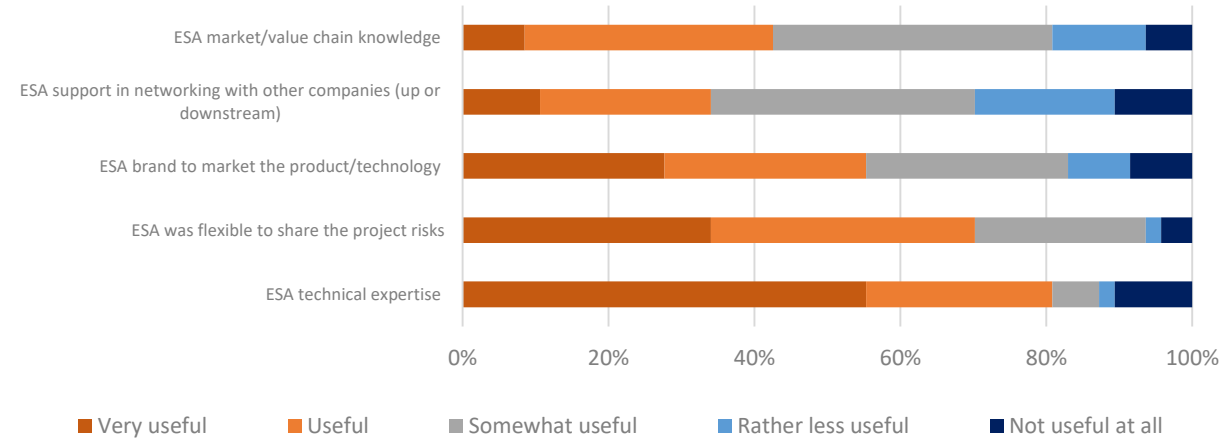
Procurement Process



Assessment NAVISP Activities



Please rank the supporting acts of ESA using a scale from 5 (very useful) to 1 (not useful)

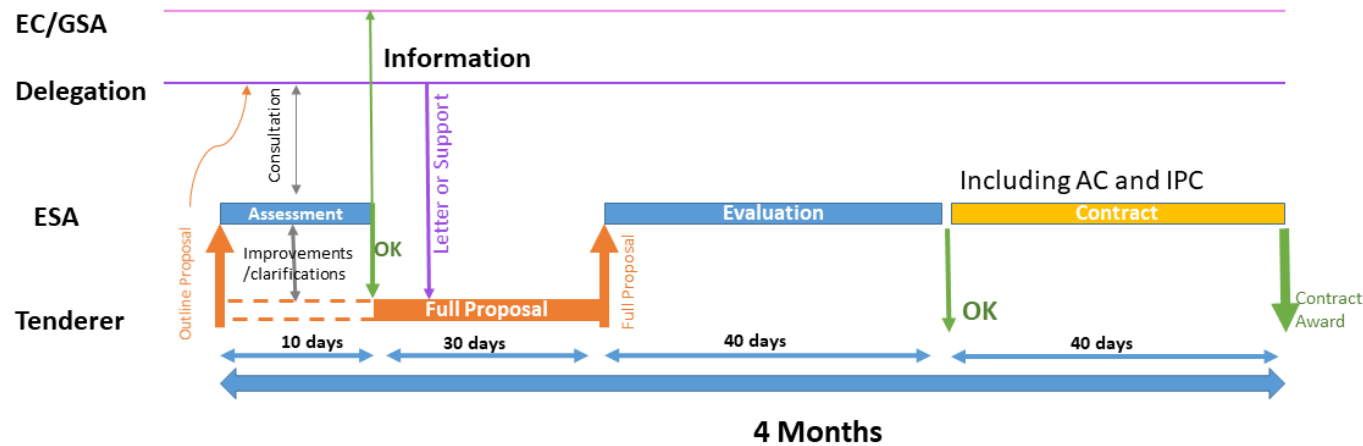


KF6

The current design of the industry survey among actors of Element 2 activities is good and reveal valuable insights to better direct the actions of the programme:

- Flexibility in the end-to-end procurement process is key.
- ESA should find ways to support industry even in market knowledge.
- Asking industry beforehand on their target innovation category and risk they intend to mitigate will help ESA improve their support and ease the monitoring of NAVISP achievements.
- Industry will appreciate that NAVISP provides support for protecting IPR and, in turn, this will help increasing the chance of developing IPR within the programme.
- Tracking of product evolution is important to better measure the success of NAVISP.

NAVISP's implementation efficiency



- ESA has made a very good work in improving programme implementation efficiency since NAVAC's last report.
- The Executive has managed to reduce by at least 30% all the key performance indicators established for proposal processing in Element 2.
- Still, the total lapse from proposal reception to contract award in Element 2 stands slightly over 200 days.
- Margins for improvement remain on companies (time to provide a complete Full Proposal and reduce the nego time) and Delegations (to promptly provide LoS).

KF7

Programme implementation efficiency has improved in every metric since the 2019 assessment by NAVAC.



NAVAC's recommendations for future phases

- NAVISP is performing well and achieving its objectives.

Persever in the way that NAVISP is conducted.

- The NAVAC's recommendations (16) from our previous assessment report still hold valid, if only with some nuances.
- NAVAC has added some new recommendations (8) at the light of the findings of the 2022 programme assessment.

But with some adjustments... (1)

- Thematic calls have demonstrated to be an effective mechanism. We recommend to launch additional thematic calls in areas of choice, e.g. “Inertial Technology in Europe”.
- Devote further efforts to fill the gaps in the European technological base for PNT systems and reduce the dependence on global supply chains (Asia, USA).
- Increase whenever possible the level of funding per activity to improve the effectiveness of the public investment.
- Reinforce outreach actions, by taking joint actions with other public bodies, industry associations or institutions (e.g. ERTICO or EASA).
- Emphasize achieving a higher industrialization level in Element 2 activities.

But with some adjustments... (2)

- NAVAC encourages ESA Executive to implement a higher research culture in NAVISP by stretching the scope of activities and increasing the flexibility in adapting project objectives to improved or changing perceptions of market needs.
- Make additional efforts to involve non-space primes in the programme, but not at the expense of non-space SMEs.
- Incorporate mechanisms that allow supporting SME in the protection and exploitation of the IPR generated within the scope of the programme.
- Devise some mechanisms to improve market knowledge and networking support in non-space sectors.
- Persist in the implementation of periodic industry surveys within the Element 2 companies to assess the commercial success of the products supported by NAVISP.



But with some adjustments... (3)


- Participating States are encouraged to simplify the internal processes for issuing Letters of Support or looking for alternative mechanisms (e.g. opt-out in Element 1 activities).
- Finally, NAVISP shall be a tool to prepare the way towards future innovative satellite navigation systems, by developing and testing some basic technologies in a way that allows to improve the definition of requirements for future systems.



NAVAC's conclusions on programme assessment

- The programme has leveraged industry investment for over 30 million euro, in addition to the 100 million public investment.
- The activities undertaken spread along the whole PNT value chain, and score high in technological innovation.
- NAVISP has engaged companies and organizations coming from both space and other sectors.
- NAVISP has helped many SME to break their way into the market, create new jobs and develop new products.
- The Participating Member States has also benefited from NAVISP by improving their national PNT infrastructures and supporting their industry.
- NAVISP can already boast quite a few success stories, and it is fair to expect some more to materialize as more ongoing projects conclude.

- Capitalize ESA's technical expertise for the benefit of the industry and leverage NAVISP to pave the way towards future innovative satellite navigation systems and key PNT technology developments.
- Keep a strong emphasis in the downstream market. This reinforces the case for investing in the upstream infrastructure



We encourage ESA to chase the chance of making NAVISP a powerful innovation engine in the PNT field by preparing for a third Phase for the Programme.

