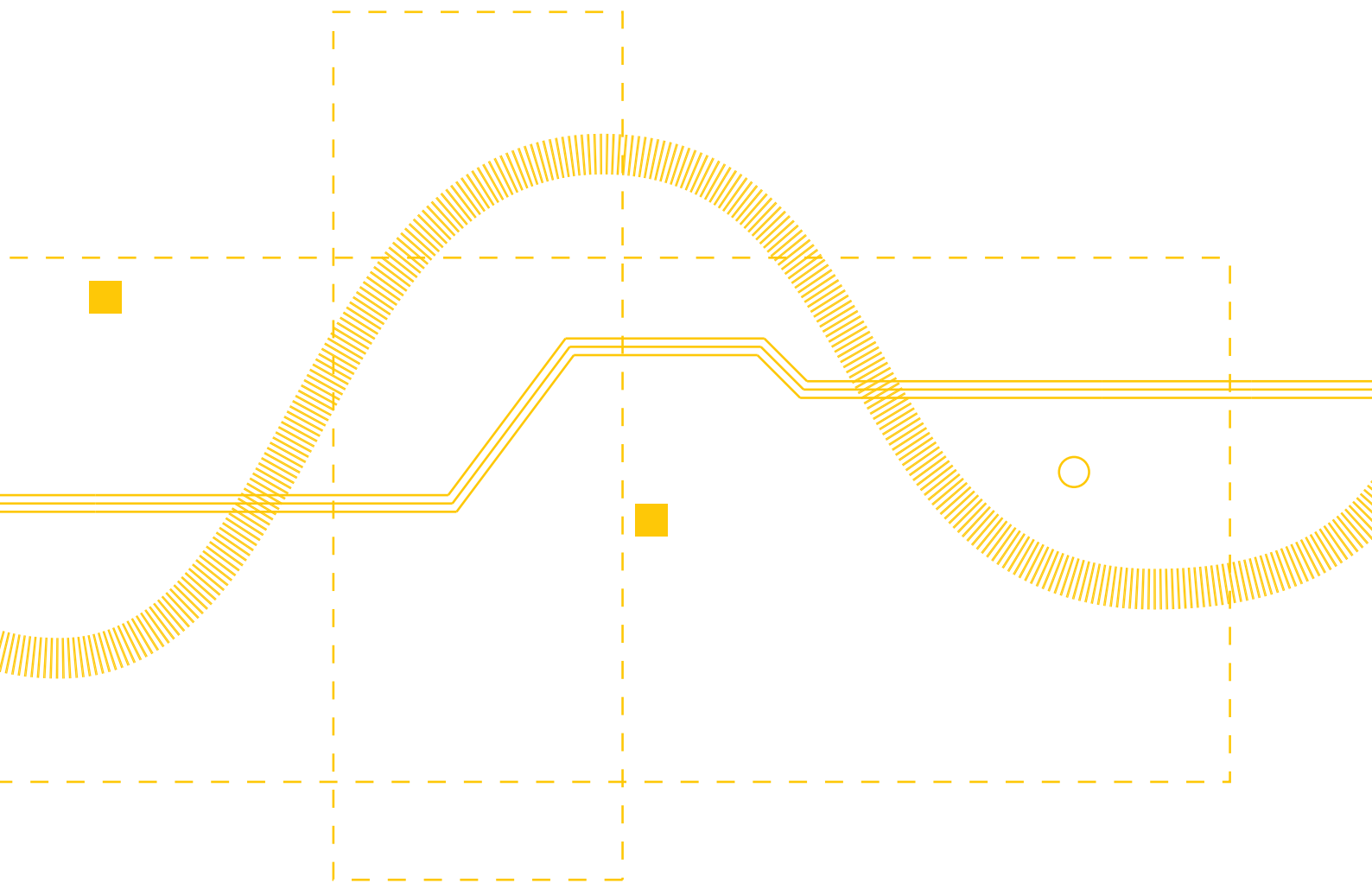**CONCORDIA**
Cyber security cOmpeteNCe fOr Research anD InnovAtion

Roadmap for

Investments

7   Roadmap for Investments

In order to enhance cybersecurity in the EU, strategic investments in the right infrastructure, people, resources, skills, financial instruments and structures to build, achieve and sustain cybersecurity is essential. This Chapter dives into how existing cybersecurity knowledge, competences and capabilities can be further built upon, double looped to identify gaps and vulnerabilities which can then be improved and further amplified to fortify cybersecurity capabilities in the EU. It also aims at creating a framework for identifying value propositions, business models, financial models which can be used by organizations, sectors, member states and the EU and continuously improved in line with evolving market trends. The Chapter also sheds light on other challenges and scenarios that can be looked into from an investment perspective.

To build, achieve, and sustain European digital sovereignty we need to know where what, who, how, and when to focus on as described or otherwise identified in the other chapters of this Roadmap. We also need to know each requires substantial investments in resources, both in people, knowledge, competencies, skills and funds, as well in all sorts of hybrid technical, organisational and economical infrastructures.

7.1 Multi-Dimensional Dynamic Puzzle

Each piece of this multi-dimensional dynamic puzzle that jointly constitutes and aims for the appropriate dynamic level of digital sovereignty requires value models, as well as business models and financial models. This, as each piece and the various dependability, interconnectivity, augmentation, and hypercubes thereof require investments, both in cash as in kind. Therewith, they also require the return of investments, being appreciated values of any kind, not only being the great value of digital sovereignty but also including (without limitation) monetary return, stake- holders value and societal value, locally, regionally, on EU level and beyond. Only investing in one or two pieces of the puzzle with not lead to a viable and sustain- able ecosystem where the various returns on investments can cater to and amplify each other.

Without the appropriate returns of investments, investments of any kind are difficult to justify, and without clear purposes and arguments to invest, it will be difficult to obtain and organize the right investments from the right investors. On the latter, one for instance will need to consider the purposes and horizon of the investment necessary, the values, interests, and horizon of the various investors. Without the right balance, clear horizons, and solid footing, both short term, mid- term, and long term, we will not be able to build, achieve, and sustain European digital sovereignty.

For instance, as an example, five member states have separately commissioned to be assessed and profile from a certain perspective, called the Cyber Readiness Index [78] by Potomac Institute for Policy Studies, in which each report identifies and tries to quantify the amount a member state should invest in and what their backlog and other cybersecurity debt is – from a governmental perspective, and only to achieve certain, described goals.

For purpose of this CONCORDIA Cybersecurity Roadmap for Europe, various objectives, challenges respectively scenarios regarding or related to the most- notable investment strategies have been identified. Some of those are already high- lighted below where others are merely mentioned yet under development in a stage that these are expected to be incorporated more extensively in the next edition of the Roadmap.

Obviously, among others, the Communication of the Commission (May 2020) and related updates thereto (November 2020) regarding 'Europe's moment: Repair and Prepare for the Next Generation' [79], in which strategic digital capacities and capabilities are explicitly prioritised, and the (upcoming) digital investments' instruments such as Recovery and Resilience Facility, InvestEU, Strategic Investment Facility, and new Solvency Support Instrument, will be taken into account and related developments monitored, as also referred to in Chapter 1 of deliverable D4.2.

Hereunder, the currently identified objectives, challenges respectively scenarios (also collectively described as initial 'mini-roadmaps') are mentioned, each generally for local, sectoral, regional, member state, European Union team building, continuous improvement, and sustainment of European digital sovereignty and the related intertwined domains.
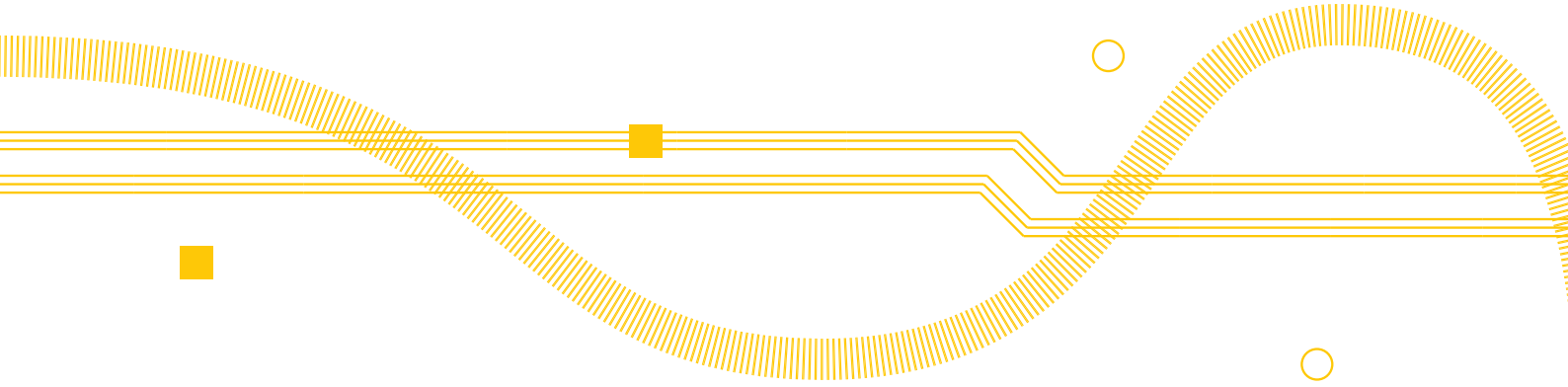
7.2 Objectives, Challenges & Scenarios

7.2.1 Objective: Landscaping H2020 Cybersecurity Deliverables

- **State of Play (SOP):** Currently and in the past period the Horizon 2020 funds have been allocated to quite some extent to projects focussing on or otherwise addressing cybersecurity and related topics regarding or related to digital sovereignty. However, there is no clarity, overview, or useful insight available whether and to what extent project results are concrete, viable, effective, and sustainable to add to the building, achieving, and sustain European digital sovereignty.
- **State of the Art (SOTA):** Having a clear, practical, and otherwise useful landscape of the H2020 cybersecurity deliverables and other results is recommended. It can give oversight and insight into what has already been done, where it can be deployed and further developed, and what is still missing. Just mapping those geographically is not enough; the various deliverables and results – and where available post-project dissemination activities – will need to be vetted at merit. The other main objective is to identify synergies, gaps, and improvements, and use these for consideration for (further) investments and the like. Where possible, one can also consider inviting, assess, and where appropriate add the deliverables and other results from similar cybersecurity-related projects of member states or regions as well. This, also to involve member states and regions in this effort.

- **GAP (SOTA -/- SOP):** The initial main GAP is the lack of mapping about the identified H2020 cybersecurity deliverables and other results to the extent deemed sufficiently concrete, viable, effective, and sustainable to add to the building, achieving, and sustain European digital sovereignty, starting with structured visualisation in identified cybersecurity domains and dimensions of (to be assessed and otherwise collaboratively and multi- angled vetted) cybersecurity research activities, innovation activities, and related products, systems, services or other capabilities of European organisations that are active in the cybersecurity domain. Thereafter, synergies, gaps, and improvements can be identified, and used for various purposes, including for consideration for (further) investments and the like, to facilitate the building, achieving, and sustain European digital sovereignty. For such vetting purposes, for instance, the various angles of the evaluation components and queries of the European Innovation Council (EIC) and related lessons learned could be considered and optimised to the purpose and particulars of the mapping and plotting described above.
- **Short-Term:** For the Short Term, bridging the initial main GAP a cross- EU initiative is necessary by mapping and plotting the landscape of H2020 (and related) cybersecurity deliverables and other results on the one hand and the various identified market needs, cybersecurity and vulnerability developments and predictions on the other hand. Where relevant, these could be, amongst others, linked with the Open Research Europe initiative that has just been launched by the Commission, the Cybersecurity Atlas, and the like.
- **Mid-Term:** For the Mid-Term, building on the results – including the mapping and plotting as set forth above – from the Short-Term activities: knowing what viable deliverables and other results are already readily available, knowing how and with whom to (help to) operationalise, deploy and sustain those, including knowing where and how to join forces, invest in and what the sought-after various values and returns of investments are, are prerequisites for European digital sovereignty.
- **Long-Term:** Where not yet achieved in the Mid-Term, such oversight, in- sights, and deployment as set forth above should be further pursued. In any case, these should be the basis for a supplement, keeping up to date, evaluating progress also regarding investments and returns on investments, improvement and otherwise optimisation.
- **Conclusions:** Where the EU has already funded numerous projects in the various Framework Programs including Horizon 2020, and it will continue to do so in subsequent programs such as Digital Europe and Horizon Europe, amongst others, this gives an excellent opportunity to build up, double-loop and further improve capabilities necessary for European digital sovereignty.

7.2.2   Challenge: Narrowing the Investment Gap

- **State of Play (SOP):** Where early-stage cybersecurity companies and other ventures are being heavily funded in other parts of the world, such business angle and other venture capital by Europeans or European organisations, as well as subsequent financing by European organisations, either public, private or other sectors, still is at a relatively yet dangerously low level within the European Union. In short, the European Union, its member states, and related sectors and organisations are outspent and outsmarted substantially. European grass-rooted initiatives, ventures or businesses, whether early-stage, SMEs, intrapreneur or otherwise, stand no chance to remain truly European if they would have the ambition to become a significant market player of any kind, and are acquired or otherwise not European anymore before they can seriously growth, scale and become European champions in their respective markets. This clearly undermines European digital sovereignty.

- **State of the Art (SOTA):** The envisioned state of the art is obvious; building European organisations with cybersecurity capabilities that the European sectors and markets – as well as markets outside of the EU – want and pay for while staying, and that can grow, scale and succeed while remaining truly European. One of the main components is to narrow the investment gap.

- **GAP (SOTA -/- SOP):** The initial main GAP is the lack of mapping about the currently fragmented and seemingly not orchestrated public and private investments in the EU and its member states, including the various stakeholders in this landscape, either being truly European or otherwise. Teaming up from the European perspective for digital sovereignty starts with transparency of and appreciation by the relevant stakeholders – which are not merely financial investors, whether public or private – and their respective and various values, perspectives, needs, and interests. Such insight and oversight lead to trust, necessary to identify and discuss if, what, and to which extent European synergies, investments, and returns on investment could and should be considered, and furthered towards deployment, nurturing, and monitoring. There need to be sufficient levels of transparency, trust, willingness, comfort, and execution power. To be clear, not only a substantial amount of structural and ongoing financial investments needs to be enabled and facilitated. The qualitative objectives, values, coordination, governance, returns, and other interests need to be very clear on a detailed level and need to be continuously optimized as per the dynamics in this Digital Age. Merely making available monetary sums will not lead to success towards European digital sovereignty. Next to solid financial investment, vital

non-financial and other qualitative attention is necessary. Obviously, it is recommended that the GAP can be taken one step or one domain or risk-dimension at a time, to try, learn, pivot, and improve. Meanwhile, it is relatively easy to discuss, architect, and prepare various relevant scenarios of potential events or occurrences that may arise or happen in the domain of European digital sovereignty.

- **Timeline:** Various multi-speed tracks can be identified and run parallel. Otherwise, the Short Term is recommended to kickstart, discuss value propositions and expectations of various returns of investments, while starting with architecting scenarios, and both Mid Term and Long Term to prepare, organise, execute, monitor, improve and sustain are essential. Narrowing the investment gap will be a dynamic and ongoing topic, that will need constant attention and agility.

- **Short-Term:** For the Short-Term, bridging the initial main GAP cross-EU initiative is necessary to map and plot the various landscapes and meta- landscape and its respective stakeholders, identify and discuss value propositions, business models, financial models, and expectations of various returns of investments. Meanwhile, starting with architecting relevant scenarios will help to identify the various benefits and preconditions and establish which appropriate net benefits are envisioned.

- **Mid-Term:** For the Mid-Term, insight and oversight will grow to a level scenario can be operationalised and deployed. Starting relatively modest yet in a way that can scale and agility to evolve and be improved is recommended. As appreciation within the EU is sought after, some traction and growth of the willingness to invest and alignment to investments are expected to increase. Further organising, executing, monitoring, and improving is essential. Depending on the uptake, narrowing the investment gap can hopefully already be scaled in the Mid-Term.

- **Long-Term:** Where not yet achieved in the Mid-Term, narrowing the investment gap can be scaled in the Long Term. As mentioned, narrowing the investment gap will be a dynamic and ongoing topic that will need constant attention and agility.

- **Conclusions:** There are various paths to address the challenge of narrowing the investment gap. Considering, operationalising, and incentivising investments require knowing the various needs, stakeholders, values, interests, and horizons as well. Addressing all relevant sectors in the whole single market to build, achieve, and sustain digital sovereignty will be too ambitious, but starting anywhere in a diligent, scenario-based way as soon as possible is highlyrecommended.
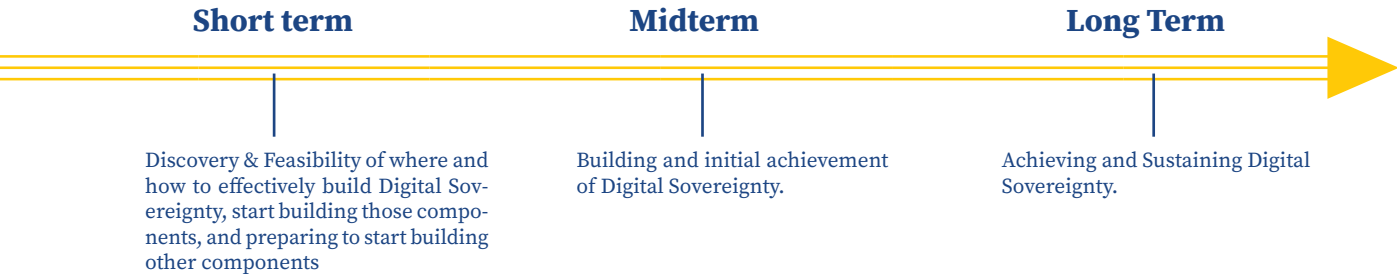
7.2.3   Other Objectives, Challenges or Scenarios

Other objectives, challenges, or scenarios regarding investment strategies are under investigation and development as a mini-roadmap, and are currently anticipated to reach a certain level of maturity and detail to be included in subsequent Roadmap edition(s), including the following:

- **Objective: European Fund for Digital Sovereignty Capabilities & Continuity.** This mini-roadmap is envisioned to enable the European Union, member states, and other stakeholders to leverage their combined investment capacities, align and federate existing and envisioned hybrid investment instruments and create a European Fund for Digital Sovereignty Capabilities & Continuity, and;
- Some objectives, challenges, or scenarios that are defined elsewhere in this Roadmap, but then where relevant developed from the investment strategies angle.

7.3   Roadmap for Investment Strategies

It is expected that certain recommendations and other details will be incorporated more extensively in the next edition of this roadmap. The visualized current version is shown in Figure 11.

Short term   **Midterm**   **Long Term**

Discovery & Feasibility of where and how to effectively build Digital Sovereignty, start building those components, and preparing to start building other components

Building and initial achievement of Digital Sovereignty.

Achieving and Sustaining Digital Sovereignty.

Figure 11: Overview from an Investment perspective of most important directions, steps, and threats for short-, mid-, and long-term timelines

7.4　　Taking Stock: SOTA & the CONCORDIA Leadership

This Chapter Roadmap for Investments of the CONCORDIA Roadmap covered both (a) the stock-taking of state of the art and GAP recommendations that resulted from CONCORDIA project tasks and deliverables during the project that are recommended to further after the project that can make the cybersecurity landscape in the EU more resilient, agile and future proof on various fronts, as well as (b) other state of the art and GAP recommendations that are not part thereof yet highly recommended as well. Regarding the first, the six (6) most notable domains and dimensions coming from such stock-taking are visualized below.

CONCORDIA Project Stock-Taking for Investments

Multi-Dimensional Dynamic Puzzle	**Landscaping H2020 Cybersecurity Deliverables**	**Cybersecurity Synergies, Gaps & Improvements**
Narrowing the Investment Gap	**European Fund for Digital Sovereignty Capabilities & Continuity**	**Trust & Transparency**

The above domains are elaborated upon within this Roadmap and in some other deliverables of CONCORDIA as well as and can be found in:

- Multi-dimensional, dynamic Puzzle – Chapter 7 (Section 7.1)
- Landscaping H2020 cybersecurity Deliverables – Chapter 7 (Section 7.2.1)
- Cybersecurity Synergies, Gaps & Improvements – Chapter 7 (Section 7.2.1)
- Narrowing the Investment Gap – Chapter 7 (Section 7.2.2)
- European Fund for Digital Sovereignty Capabilities & Continuity – Chapter 7 (Section 7.2.3)
- Trust & Transparency – Chapter 7 (Section 7.2.3)

7.5　　Contributions for EU Policies: Roadmap for Investments

This Chapter Roadmap for Investments – obviously – has integral and critical EU policy relevance from all perspectives, including to build, achieve and sustain digital sovereignty and otherwise be fit for the further expanding and evolving Digital Age, both for the EU, the member states, but also society, economy, public and private sector in-

cluding SMEs, citizens, educational institutes and other organisations, and both for the short, mid, long and extreme long term. For that, the recommendations highlighted or otherwise mentioned in this Chapter can help identify, further, improve, augment or otherwise support valuable policy initiatives and instruments, and provide a valuable roadmap and various mini-roadmaps supporting the discussion of priorities and paths to follow, and nuances to observe and cater for.

*Please note, that this is a part of the CONCORDIA Roadmap. If you are interested in the whole document, you can download it **here.***
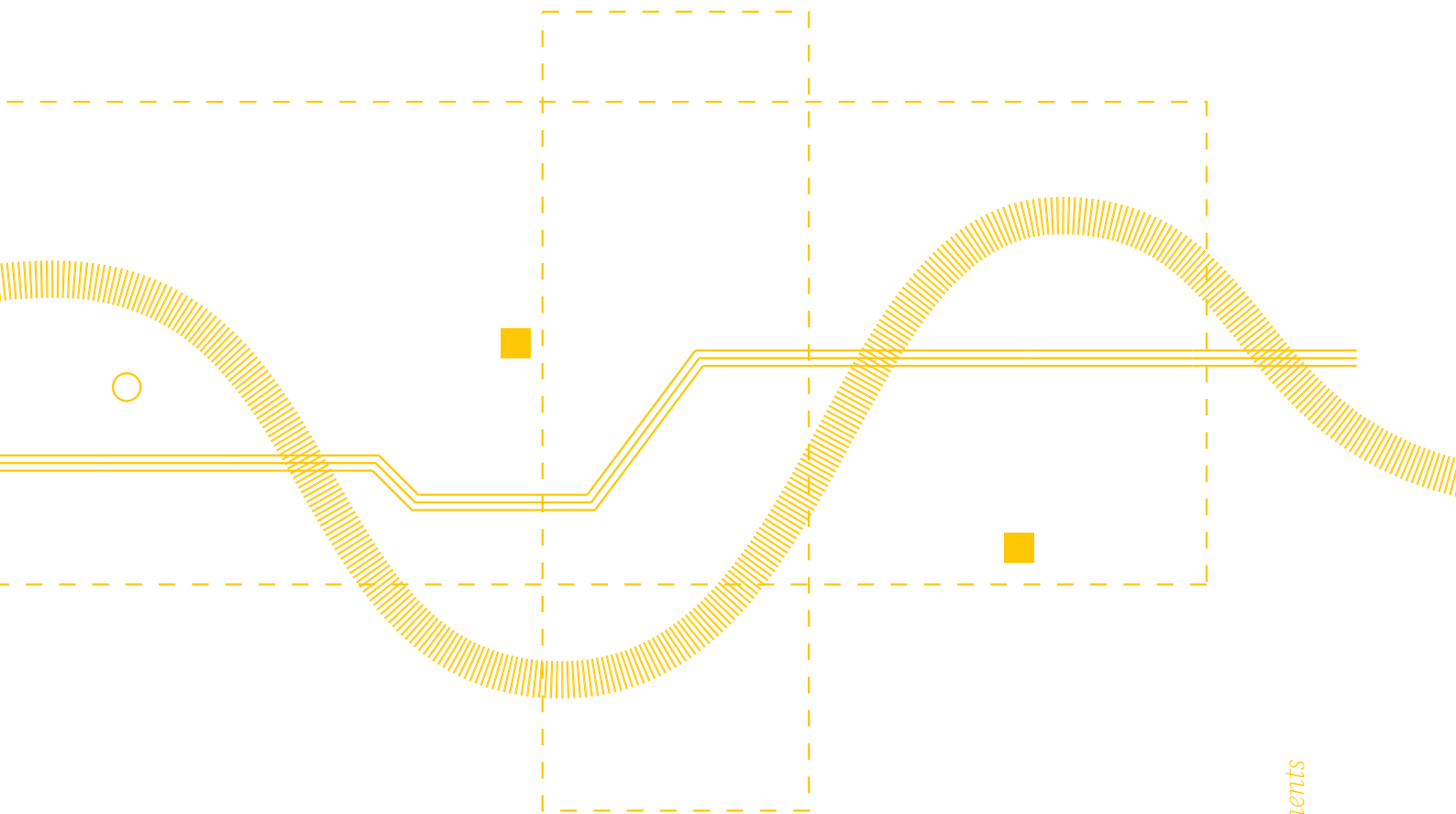
[78]   Potomac Institute for Policy Studies. ***Cyber Readiness Index Country Profiles.*** Accessed Dec. 18, 2020.

[79]   European Commission. ***Europe's Moment: Repair and Prepare for the Next Generation.*** (May 27, 2020). Accessed Dec. 18, 2020.

Roadmap for Investments