Policy paper for Cisco

AI for connectivity: how policy makers can help digitalisation

Ian Adkins, Andrew Daly, Adaora Okeleke, Dalya Glickman, Simon Saunders

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Contents

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Analysys Mason Limited
North West Wing, Bush House
Aldwych
London WC2B 4PJ
UK
Tel: +44 (0)20 7395 9000
enquiries@analysysmason.com
www.analysysmason.com
Registered in England and Wales
No. 5177472

Executive summary

Artificial intelligence (AI) systems have significant potential to improve the operations of communications networks, including those offered by communications service providers (CSPs) and also end-user organisations (including enterprise and governments).

Although the adoption of AI in networks has begun, the communications industry has significant progress to make in order to fully realise the potential of AI. Policy makers, including governments and regulators, have a role to play in facilitating this adoption, and maximising the benefits of AI in communications networks. This paper sets out recommendations for how policy makers can help network operators to overcome challenges to embrace the capabilities of AI, which will drive a range of benefits in support of countries' wider digitalisation goals.

1.1 Improvements in communications networks operations will support digitalisation

Most national and regional governments have identified the benefits of digitalisation to the societies and economies that they govern. The goals of digitalisation include economic growth, increasing productivity and skills, improved delivery of public services, production of intellectual property, improving competitiveness with other economies, social inclusion and sustainable living. Any improvements in the operation and performance of digital communications networks will further support these goals. AI has the potential to provide improvements to networks across four key areas:

- improved resilience, including security and reliability, which is critical to underpinning the success of the digital economy
- improved operational efficiency, which lowers costs and therefore can allow greater coverage and capacity, and/or lower prices
- improved technical performance and customer experience, leading to increased satisfaction with services on the networks
- savings in energy consumption, which mitigate the carbon impact of networks.

Overall, AI supports the operation of networks, which in turn helps to unlock the benefits of digitalisation.

1.2 AI applications in communications networks combine to deliver digitalisation benefits

As communications networks continue to increase in size and complexity, with much of the potential functionality operating at 'machine scale', more control of that functionality will need to be handled by machines. AI has wide potential to be implemented in networks in both 'customer-facing' and 'network-facing' functions. While customer-facing functions are relevant to the digitalisation goals of policy makers, we have focused on the use of AI in network-facing functions, as these most directly support the aims of resilient, efficient, capable and sustainable networks.

We have chosen to focus on the benefits provided by a selection of the most promising use cases for the implementation of AI in communications networks. Our chosen applications are applicable to a wide range of interpretations of digital communications networks:

- networks operated by CSPs, such as mobile (e.g. 5G) and fixed (e.g. fibre) networks; and
- networks operated by public and private organisations (enterprise and government networks), which may run as an 'overlay' on the CSP networks.

This paper highlights the following applications in relation to AI in communications:

Anomaly detection, root cause analysis and issue prioritisation	AI-powered anomaly detection, root cause analysis and issue prioritisation allows rapid recovery from security and reliability issues, and fewer issues in the future. These features reduce network costs and minimise downtime for end users, reducing the wider economic and societal impact of security and reliability incidents, while boosting confidence in communications networks.
Configuration fidelity	AI-supported network configuration fidelity helps to reduce the likelihood of human error-driven network outages, by ensuring that all network equipment receives the correct parameters during both set-up and maintenance.
Predictive maintenance	AI-powered predictive maintenance systems 'listen' to a wide range of data inputs from the network, and by analysing the circumstances of previous failures can plan and target maintenance activities to avoid breakdowns before they occur.
Capacity management and planning	AI can analyse current and historical traffic data and form predictions based on previous patterns, to enable more accurate forecasting of when new investments should be made. This benefits both end-user experience (i.e. during busy periods) and operator cost management.
Capex optimisation	AI-enabled capex optimisation uses the data from the network to guide effective upgrades of the existing network to improve the experience of current customers, and help increase network coverage into new areas.
Optimisation of wireless networks	AI has the potential to improve the capabilities of wireless networks, which are typically constrained by the coverage and capacity dynamics of the spectrum they use. AI can make the best use of the spectrum resources available through dynamic allocation of spectrum, advanced beamforming and interference mitigation.
Energy consumption optimisation	The data analysis and advanced computation capabilities of AI can provide energy consumption (and cost reduction) benefits. These include dynamically putting idle network assets to sleep, and also potentially replacing conventional processing functions with a more energy-efficient alternative.

1.3 Overcoming implementation barriers will support adoption of AI in communications

Despite the potential benefits of AI applications in communications networks, implementation is being held back by a range of barriers:

- Data: while communications networks are rich sources of data, this data is often 'siloed' within the network operator (i.e. for different network- or customer-facing functions), requiring significant resources to access and prepare data, even before it can be used by AI.
- Trust: including concerns over both network configuration integrity and network security. Within the 'critical infrastructure' mindset of connectivity providers, network teams can be reluctant to allow AI to influence the operation of their systems (e.g. by recommending network parameters, or other network-related decisions). Network teams may also have security concerns related to the use of third-party AI models from external environments being allowed to work on internal data.
- Skills: communications network providers tend to be staffed by network experts, not data scientists and code debuggers. Their networks are generating data at an increasing rate, but they may not have enough of the right sort of skills to capitalise on the opportunity. Furthermore, existing governance teams will need to consider new types of issues, including whether any deployment of AI is done in a secure and responsible manner.
- Budget: deployment of any new technology by an organisation requires investment, and must be shown to provide a positive return. Some communications network providers are struggling to demonstrate a positive return on investment for AI deployments, due to the large up-front costs and uncertainties over the impact of AI on their operations.
- Regulation: existing regulation may be creating barriers both explicit (e.g. by imposing a significant reporting and governance burden on the use of AI) and implicit (e.g. because it is not clear how or whether the regulations can be met). These issues may be compounded where AI regulation overlaps with other areas of regulation, such as those related to data localisation and data transfer, or cloud, cyber security, telecoms, energy).

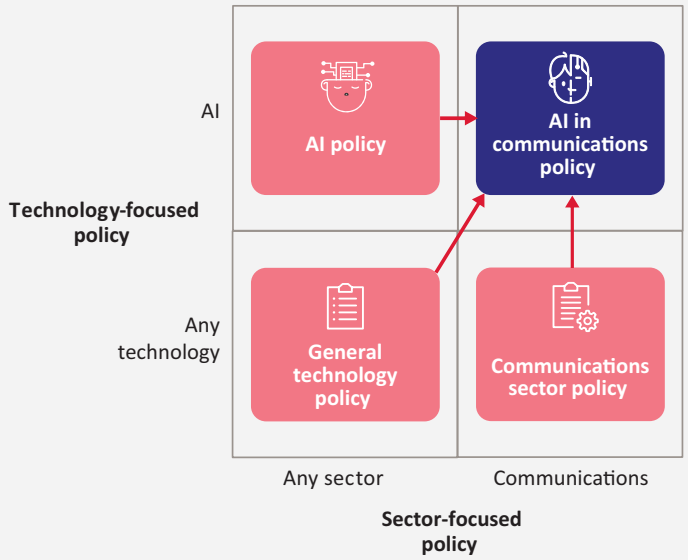
1.4 Policy makers have tools to maximise the potential of AI in communications networks

Some jurisdictions (whether national or regional) already have some form of AI-related and/or communications-related policies. There is an opportunity for policy makers to bring these elements together, to create a supportive environment for AI in communications, for the following reasons:

- communications networks are a critical foundation of all digital transformation goals; and
- the high-tech nature of communications makes it a natural first step for more sector-specific AI policy actions, which can lead the way for implementation in other sectors.

Existing policy can be tailored to focus on AI in communications, as shown in Figure 1.2.

Figure 1.2: Illustration of how existing policy can be targeted at AI in communications
[Source: Analysys Mason, 2025]



We present recommendations overleaf for policy makers under four high-level themes: engage, facilitate, implement and intervene.

Policy makers have a range of tools to maximise the potential of AI in communications networks

Engage 	**Continual assessment of industry status**	Current and future trends	Multiple intelligence sources	Wide stakeholder engagement	Regulator reporting outputs
	Convene industry stakeholders	Share lessons and successes	Sub-groups with specific focus	Regular meetings	Inception report and regular updates
Facilitate 	**Guidance on best practice**	Frameworks, with guiding principles based on industry success	Standards, used sparingly to enable interoperability		
	Ensure AI skills are available	Map what skills are needed and where	Government-supported training programmes	AI modules in university courses	Publish budgets
Implement 	**Targeted R&D programmes**	Define specific goals for funding	Define project award criteria	Infrastructure partnerships techniques	Publish budgets
	Use of AI in government networks	Deploy AI in government networks	Build on initiatives and engagements above	Share results with trusted stakeholders	
Intervene 	**Incentives to invest**	Tax incentives	Government-supported finance	Links to R&D programmes	Links to specific applications
	Shape outcomes	Regulation should be outcomes based	Collaborate and harmonise	Issue guidance on how to meet	Consult and iterate on changes

Communications networks are a natural fit for the capabilities of AI. AI-enabled communications networks are more resilient, capable, efficient and sustainable than conventional networks While there are implementation barriers to overcome, policy makers can take a leadership role in addressing these, and help to deliver wider digitalisation goals

2

Policy makers should consider the role of AI in meeting digitalisation goals

This paper examines how integrating artificial intelligence (AI) into communications networks can improve their performance, thereby advancing wider digitalisation[1] efforts, and contributing to economic and societal goals.

2.1 Many countries and regions have clearly identified the benefits of digitalisation

Most national and regional governments have identified the benefits of digitalisation to the societies and economies that they govern. Though the specific goals of digitalisation strategies vary between different jurisdictions, some common themes include:[2]

- driving economic growth and prosperity
- enhancing productivity of businesses and public services
- developing new skills and intellectual property
- increasing competitiveness with other economies
- ensuring social inclusion and closing the digital divide
- supporting a more energy efficient and sustainable society.

These aims are critically underpinned by digital communications which are:

- resilient, including secure and reliable (i.e. resistant to cyber attacks and technical faults)
- widely used (i.e. with good take-up by end users)
- widely available (i.e. with good coverage and performance across both urban and rural areas)
- economically sustainable (i.e. where network providers can earn a fair return and can continue to invest)
- environmentally sustainable (i.e. efficient in the consumption of energy and the associated emissions of carbon).

2.2 There is a clear link between digitalisation, communications networks and AI

While digital communications networks are typically well established, any improvements in their operation and performance will further support the goals described above. AI has the potential to provide such improvements across four key areas:

- AI can deliver security and reliability benefits, which improves users' confidence in digital services and the underlying networks: something which is critical to the success of a digital economy.

- AI can improve operational efficiency, which lowers costs. Lower cost means more network coverage (because the commercially viable limit of coverage can be pushed further into rural areas), more capacity

[1] We define digitalisation as the process of integrating digital technologies into all aspects of society. This transformation affects how businesses operate, how services are delivered, and how end users interact with each other, and with service providers and institutions.

[2] Themes inspired by a review of digital strategies from the USA, the European Union and the UK.

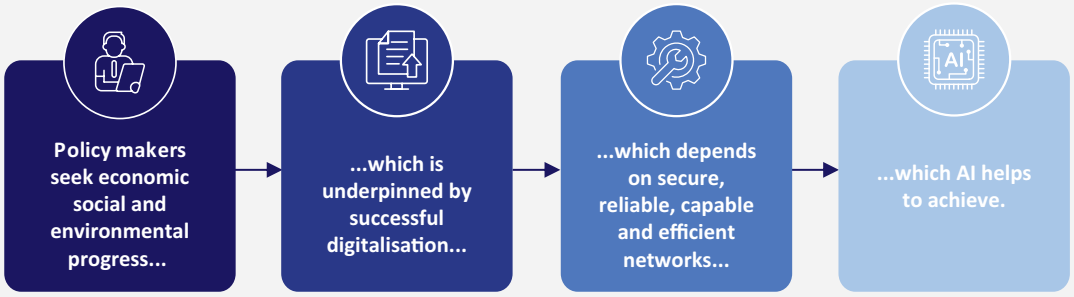
(because more upgrades can be delivered from the available budget) and/or lower prices (which encourages take-up of the networks).

- AI can improve network technical performance for metrics such as spectrum efficiency and consistent quality of experience. AI can also provide a better customer experience, which helps to protect users' perception of the network. This, in turn, enhances revenue performance by lowering customer churn.

- AI can deliver savings in energy consumption by networks, which will alleviate some of the scrutiny being placed on digital communications as a source of carbon emissions, and support wider national and regional decarbonisation goals.

Overall, AI supports the operation of networks, which in turn helps to unlock the benefits of digitalisation. These interdependencies are summarised in Figure 2.1.

Figure 2.1: Interdependencies between digitalisation, networks and AI [Source: Analysys Mason, 2025]



3

Implementing AI in networks can deliver a range of benefits

AI has broad potential to deliver a range of benefits to the operation and performance of digital communications networks, whether they be offered by telecoms operators, or by 'end-user' organisations such as governments and enterprises. In this section we start with an introduction to the basic concepts of using AI in communications, before highlighting the benefits of a selection of the most compelling applications.

3.1 Introduction to the use of AI in communications networks

AI has wide potential to be implemented in networks. Communications networks are a natural fit for the capabilities offered by AI:

- as communications networks continue to increase in size and complexity, with much of the potential functionality operating at 'machine scale', more control of that functionality will need to be handled by machines; and
- networks are rich sources of data, which is essential to both 'train' AI models, and then for these models to 'infer' results based on ongoing access to data. Data comes from two sources: data on the volumes of traffic being carried by the networks, and data on how the network is switching and routeing that traffic.

In the following sub-sections, we provide an introduction to the fundamentals of using AI in communications networks.

3.1.1 AI is the use of machines and computers to mimic aspects of human intelligence

AI is a concept whereby a set of technologies is used to create machines and computers that can mimic human intelligence and perform advanced functions such as seeing, understanding and translating language (in either written or spoken formats), or analysing data to make predictions and recommendations.

These technologies are based primarily on machine learning (ML) and deep learning (DL) techniques. They are crafted to yield specific outcomes that can be applied to daily business operations to achieve several benefits, including the automation and simplification of complex tasks to deliver better experiences to customers and more efficient operations.[3]

3.1.2 We can split the use of AI in communications networks into generative and discriminative[4] AI

Much of the current interest in AI is around generative forms of AI. Generative AI (GenAI)-based tools are software applications that use ML and DL models to create new content such as text, images and videos. These models are trained to recognise patterns in datasets and use their learnings to perform content generation-related tasks including content summarisation, translation and transcription.

However, the other (non-generative) form of AI, often called discriminative AI, is of critical importance to the future of communications networks. These AI-based tools include computer vision, predictive systems

[3] https://www.analysysmason.com/research/content/articles/generative-artificial-intelligence-rma14/

[4] For use of term, see Infocomm Media Development Authority and Personal Data Protection Commission (2020), https://www.pdpc.gov.sg/-/media/Files/PDPC/PDF-Files/Resource-for-Organisation/AI/SGModelAIGovFramework2.pdf

and prescriptive systems (including recommendation engines) and are integral to the overall AI landscape. They have been adopted by multiple industries, including communications, and are beginning to play important roles in transformation journeys.

A summary comparison of generative versus discriminative AI is provided in Figure 3.1.

Figure 3.1: Comparison of attributes of generative versus discriminative AI
[Source: Analysys Mason, 2025]

Comparison	GenAI	Discriminative AI
Overall purpose	Creates new content by learning patterns and structures from its training data	Analyses and interprets data it is provided to make predictions, decisions and classifications
Underlying computation models	Developed using multi-purpose foundation models such as large language models (LLMs)	Developed using comparatively small AI models which are task specific
Example outputs	Text transcription, agentic support and code generation	Capable of supporting prediction, anomaly detection and recommendation systems
Potential application within communications networks	Numerous applications in customer-facing functions, including customer service and product recommendation. Can provide a user interface for network operations, along with potential to enact autonomous network functions	Core to the analysis and management of the communications networks themselves, including for resilience and efficiency
	We discuss a selection of network use cases in detail later in this paper	

3.1.3 We have focused on network-facing applications of AI, for multiple network types

AI for communications networks has applications in both 'customer-facing' and 'network-facing' functions. While customer-facing functions are relevant to the digitalisation goals of policy makers, we have focused on the use of AI in network-facing functions, as these most directly support the aims of resilient, efficient and sustainable networks.

However, the applications considered in this paper are applicable across a wide range of network types, including:

- networks operated by communications service providers (CSPs), such as mobile (e.g. 5G) and fixed (e.g. fibre) networks; and
- networks operated by public and private organisations (enterprise and government networks), which may run as an 'overlay' on the CSPs' networks

The AI applications we discuss in this paper are applicable across the full physical and logical scope of communications networks, including from the radio and fibre access networks, through to intermediate switching and routeing locations, and data centres (and communications within data centres).

3.1.4 We discuss a selection of the most promising use cases in relation to AI in communications

Given the focus of the paper on network-facing functions, we have chosen to focus on the benefits provided by a selection of the most promising use cases. These use cases and their associated benefits are summarised in Figure 3.2, and discussed in more detail in the sections below.

Figure 3.2: Summary of selected AI use cases and associated benefits [Source: Analysys Mason, 2025]

	Benefits provided by each use case				
Use case	**Security**	**Reliability**	**Performance**	**Cost efficiency**	**Energy efficiency**
Anomaly detection, root cause analysis and issue prioritisation	✓	✓		✓	
Configuration fidelity		✓	✓	✓	
Predictive maintenance		✓	✓	✓	
Capacity management and planning			✓	✓	✓
Capex optimisation				✓	
Optimisation of wireless networks		✓	✓		✓
Energy consumption optimisation				✓	✓

3.2 Anomaly detection, root cause analysis and issue prioritisation

The resilience of communications networks is critical to the success of a more digitalised society. As more public and private organisations become dependent on communications networks for their operations, any disruption or outage will have a significant economic impact. On an individual level, interruptions in connectivity are at best inconvenient and at worst create a risk to life.

Two of the main sources of disruption to communications networks come from external threats (e.g. cyber attacks) and internal faults (e.g. due to equipment failure or mismanagement).

The capabilities of AI are ideally suited to mitigating the resilience risks from cyber attacks and faults, building on the data available from the networks. Communications networks generate vast amounts of data, which can be categorised into two broad types of information:

- information on the end users' data conveyed by the network, including traffic flows and volumes, as information is exchanged between content sources and end users[5]

[5] Also known as the 'user plane'.

- information on the operation of the network itself, in the form of logs created by each piece of equipment in the network. These logs include information on traffic, diagnostics, maintenance and security.[6]

AI has the ability to analyse and learn from that data, and support the resilient operation of the network in three ways:

Anomaly detection	AI anomaly detection is a technique whereby AI is used to identify unusual patterns in a dataset. This technique can be applied to the data available from the network, to identify degradations in performance, unexpected errors, security intrusions or other unexpected events of interest.[7]
Root cause analysis	AI can quickly analyse the vast quantities of data from the network to identify the root cause of any interruption being experienced. This can include the point of origin and nature of a cyber attack, and also the specific issues causing a fault. Once the issue is identified, actions can be taken to rectify the issue, identify it quickly in the future, and potentially prevent it from happening again at all.
Prioritisation of issues and automation of response	Depending on the nature of the issue, network teams may be presented with warnings from multiple elements of the network. AI can help to prioritise these issues so that effort can be focused on the most impactful to quickly restore service. In this case, the two categories of AI can work together: discriminative AI identifies and prioritises the issue, while GenAI creates a user-friendly interface, to query a knowledge base for suggested options for resolution. Where appropriate, AI can automatically implement the resolution, without human intervention, according to rules previously defined by the network team.

Some providers of communications networks are already leading the way in using AI to enhance the resilience of their networks to cyber attacks and internal faults, as summarised in Figure 3.3.

Figure 3.3: How network providers use AI to improve resilience [Source: Analysys Mason, 2025]

Example	Description
Automated network and security operations	Nokia is to provide T-Mobile Netherlands with a range of managed security services to cover all network elements, including AI-based network optimisation and security automation. For example. Nokia's NetGuard Audit Compliance Manager will facilitate automated auditing and remediation of network security configurations.[8]
Cyber-threat protection for university	The University of Derby (UK) has implemented AI-powered security measures and behavioural analytics in order to protect its critical network infrastructure, including its servers, systems and cloud environment, from cyber threats. The solution, provided by Palo Alto Networks, uses data analytics to alert the university to incidents and conduct root cause analysis.[9]

[6] Also known as the 'control plane'.

[7] Anomaly Detection Using AI & Machine Learning | Nile.

[8] https://www.nokia.com/about-us/news/releases/2021/05/27/nokia-selected-by-t-mobile-to-deliver-managed-security-services-and-optical-network-modernization/

[9] https://www.paloaltonetworks.co.uk/customers/university-of-derby

Example	Description
Boost to mobile and fixed network reliability	True Corp's Business and Network Intelligence Center (BNIC) uses AI to monitor and analyse its network as well as to automate key network functions and propose resolutions to network issues.[10]
In-house developed root cause analysis solution	KT (KT's Network Operation Intelligence Professional Developer Groups in the KT R&D Centre) developed its in-house AI-based network failure Root Cause Analysis (RCA) solution called "Dr Lauren". Opex savings are estimated to be USD1.2 million annually.[11]
Installation fault management	BT is using AI to support quality audits to detect and predict faults in equipment during installation, boosting efficiency by reducing the need for repeat visits.[12]
Issue prioritisation in full-fibre network	Orange Group is applying ML technologies to its fibre-to-the-home (FTTH) network data to prioritise network problems that must be resolved and to identify the root causes of network failures and associated remedies. By applying AI and automating resolution workflows, Orange has avoided 280 000 field trips and saved EUR20 million per annum.[13]
Streamlining of network operations	DENSO (automotive industry) used Cisco's DNA Center and AI capabilities to streamline its network operations, visualise network configuration, perform root cause analysis and suggest solutions. The DNA Center also performs automatic updates of the factory network in 15 locations.[14]
Early anomaly detection and root cause analysis	Ooredoo Qatar is implementing Reailize's Continuous Assurance and Anomaly Detection solutions for its network. The solutions use AI to detect network anomalies, perform root cause analysis and recommend remediation actions.[15]
Centralised network health monitoring for improved incident detection	Globe Telecom uses Cisco Splunk's Enterprise Platform solution to centralise its network, application and database monitoring practices, facilitating accelerated reporting, improved anomaly detection and a reduced burden on resources. Globe Telecom also uses Cisco Splunk's IT Service Intelligence solution,[16] which sits on top of the Cisco Splunk Enterprise Platform and facilitates AI-driven incident detection and resolution.[17] Following implementation, Globe Telecom achieved an 80% reduction in incident detection time and a 50% acceleration in system health reporting.[18]
Enterprise use of AI for wireless optimisation	expert, an electronics reseller, used Juniper's AI-Native networking platform to provide wireless, secure and reliable LAN connectivity, with automated network insights, fault detection and resolution.[19]

[10] https://developingtelecoms.com/telecom-business/operator-news/16247-true-corp-leverages-ai-to-improve-fmc-broadband-reliability.html

[11] https://www.gsma.com/futurenetworks/wiki/ai-based-network-failure-root-cause-analysis-solution-kt/

[12] See Analysys Mason's AI in telecoms: a strategic guide for operators and vendors. https://www.analysysmason.com/research/content/articles/ai-telecoms-strategic-guide/

[13] Ibid.

[14] https://www.cisco.com/c/en/us/solutions/collateral/enterprise-networks/denso-case-study.html

[15] https://developingtelecoms.com/telecom-technology/customer-management/14812-ooredoo-qatar-focuses-on-customer-experience-with-new-partnership.html

[16] https://www.enterpriseitnews.com.my/optimising-operations-and-innovation-with-data/

[17] https://www.splunk.com/en_us/products/it-service-intelligence.html

[18] https://www.splunk.com/en_us/pdfs/resources/e-book/forging-the-future.pdf

[19] https://www.juniper.net/gb/en/customers/2024/expert-case-study.html

3.3 Configuration fidelity

The issues discussed in the previous section all relate to causes beyond the direct control of the network operator. However, human error within the operator is a significant potential source of network disruption, especially through the mismanagement of network configuration.

Network configuration is the process of arranging a network's settings, controls and policies to support interaction between the devices and systems that make up the network.[20] Network configuration settings define how different networks, and the pieces of equipment within those networks, talk to each other. While a key aspect of configuration fidelity is ensuring that network settings are generally consistent with technical policies, it is critically important that those settings are correctly defined or amended, otherwise the operation and performance of the network(s) will be affected, potentially severely.

The capabilities of AI are well suited to avoiding network configuration errors. AI can analyse and recommend the optimal configuration settings for a network, considering different equipment types from different vendors and evaluating the correctness of a configuration to ensure operational integrity. Since numerous errors arise due to the scale of modern communications network, a key application for AI would be to inspect the configuration of each individual network element, and highlight where the required configuration has not been implemented.

3.4 Predictive maintenance

AI has the potential to stop maintenance failures in the network before they occur. Again, building on the data generated by the network (see above), and coupled with additional data provided by sensors on power supplies, cooling functions and other assets, AI can learn and predict when maintenance-related failures are likely to occur. This is a key application of discriminative AI: by analysing large amounts of existing data, AI can recognise the patterns that led to previous maintenance-related failures. Some progressive failures in the network can include: degradation of radio performance due to progressive water ingress, corrosion of connections, power supply leakage, degradation of earthing integrity, etc. With access to the network's data, AI can then 'listen' to the operation of the network to identify whether those same circumstances are starting to happen again and to plan and target maintenance activities to avoid them. These systems can often then provide recommendations on the remedial activities required, sourced from a knowledge base.[21]

Some network providers are already exploring AI-powered predictive maintenance for their networks, as summarised in Figure 3.4.

[20] https://www.splunk.com/en_us/blog/learn/network-configuration.html

[21] https://blogs.cisco.com/energy/how-predictive-maintenance-works-5-steps

Figure 3.4: How network providers use AI for predictive maintenance [Source: Analysys Mason, 2025]

Example	Description
Predicting network failures on a fibre network	Verizon implemented predictive AI algorithms to forecast service-affecting network failures that would have an impact on its FiOS offering.[22]
Reduction in truck-roll breakdowns	AT&T's AI-as-a-Service platform links on-premises and cloud data with AI service providers including H2O.ai. AT&T is using the platform to develop use cases such as predicting battery failures on trucks used to service towers and other infrastructure. This resulted in annual savings of USD7 million by reducing truck breakdowns.[23]

3.5 Capacity management and planning

Similar to other use cases described above, AI systems can analyse the data on traffic flows in the network to manage capacity and predict (with high accuracy) when it should be increased. This function is critical to a good customer experience, to mitigate against a material slowdown during busy periods. AI can analyse current traffic data and form predictions based on previous traffic patterns, providing guidance as to when the capacity of the network should be increased (i.e. increasing the number or size of switches, routers, radio channels, antenna ports and other network assets). Not only do these features help to ensure a good customer experience, but they can also help to manage the cost of accommodating continuous upgrades to the network in the face of ever-increasing traffic. Some network operators are already making use of this capability of AI, as summarised in Figure 3.5.

[22] See Analysys Mason's *AI in telecoms: a strategic guide for operators and vendors* https://www.analysysmason.com/research/content/articles/ai-telecoms-strategic-guide/

[23] https://h2o.ai/case-studies/att-transformed-into-an-ai-company-with-h2o-ai/

Figure 3.5: How network providers use AI for capacity management and planning [Source: Analysys Mason, 2025]

Example	Description
Increase in capacity planning accuracy	Indosat Ooredoo Hutchison uses AI for network capacity management, including capacity planning. Capacity planning accuracy used to be 75–80% when done manually. With AI/ML, this has increased to almost 98%.[24]
Controlling network congestion to deliver good customer experience	Telenet is driving its "amazing customer experiences" campaign with the help of Sandvine's Application and Network Intelligence portfolio to control network congestion and create high-quality experience across its network.[25]
Real-time analytics for network capacity planning	As part of its new strategic deal with Google Cloud, Bell Canada will be using Google's AI capabilities to gain valuable insights using real-time data analytics of the network, which can be used to improve service assurance and assist with network capacity planning.[26]

3.6 Capex optimisation

AI can support communications network providers in their capex planning activities. The application combines granular data from multiple sources in the network and the wider operation of the communications provider to generate targeted recommendations for capex investment. This allows limited capex reserves to directed where they will have most impact: either improving the quality of service of existing network coverage, or pushing network coverage out into new areas. Some examples of AI-enabled capex optimisation are included in Figure 3.6.

Figure 3.6: How network providers use AI for capex optimisation [Source: Analysys Mason, 2025]

Example	Description
Identification of mobile sites with greatest potential impact	Orange Spain used ML to uncover the best cell sites to invest in to improve user experience and reduce churn rates. The analysis considered the performance of individual sites based on various metrics, e.g. dropped-call rates and browsing speed.[27]
Automation to inform "smart capex" decisions	Vodafone is using AI and ML capabilities to feed information from over 300 data sources into a digital twin of the network. These analytics are being used to inform 'smart capex' decisions, helping Vodafone to reduce its capital and operating expenses. This additional automation has generated savings of over EUR500 million in capex and opex over three years.[28]

[24] https://developingtelecoms.com/telecom-business/operator-news/16926-ai-native-telco-and-techco-indosat-ooredoo-hutchison-eyes-ai-for-indonesian-digital-future.html

[25] https://www.telecomtv.com/content/network-automation/telenet-grows-4g-5g-and-wifi-networks-with-sandvine-application-intelligence-42908/

[26] https://www.bce.ca/news-and-media/releases/show/Bell-partners-with-Google-Cloud-to-deliver-next-generation-network-experiences-for-Canadians

[27] https://hellofuture.orange.com/en/improving-business-operations-through-ai/

[28] https://www.telecomtv.com/content/digital-platforms-services/vodafone-cto-network-automation-has-saved-us-500m-in-three-years-46723/

Example	Description
Identification of connectivity gaps for network expansion	Telkomsel is using Google Cloud's GenAI solution to identify locations with connectivity gaps for subsequent network infrastructure deployment.[29]
AI-powered analytics to form an infrastructure investment strategy	Globe Telecom worked with Thinking Machines to build an AI model to generate socioeconomic class (SEC) classification estimates for households. This model was fed a combination of satellite imagery, telecoms usage data and external location data. Globe Telecom used this service to make decisions on where to invest in infrastructure.[30]

3.7 Optimisation of wireless networks

While the AI use cases we have discussed so far are applicable to any type of network, wireless networks in particular stand to gain substantially from AI-enabled capabilities. Wireless networks bring significant benefits in terms of coverage, mobility and flexibility, but are characterised by the limits of the spectrum they use. Spectrum is a scarce resource and typically places constraints on the coverage and capacity of the wireless networks (in the absence of investment in additional sites). Wireless networks increasingly use multiple spectrum bands and advanced processing techniques. As this increase in complexity is only set to continue, AI is well placed to help.

AI can optimise the performance of wireless networks, so that they make the best use of the spectrum resources available to them, in the following ways:

Dynamic spectrum allocation	AI can drive dynamic allocation of spectrum resources, potentially related to different network sites or users or applications being served by the network. This approach ensures that each user and use case of the shared spectrum resource gets a good quality of service, thereby improving overall spectral efficiency. It also helps to expand the overall range of services that can be accommodated by the available spectrum, such as a mix of public and private, terrestrial and satellite network providers.
Intelligent beamforming	AI could be used to address the increasing complexity of beamforming[31] in future wireless networks (due to user mobility, elevated frequencies, and a higher number of antennas) by automatically adjusting the necessary network parameters.[32] It can also enable newer forms of intelligent radiating system envisaged for 5G Advanced and 6G such as Reconfigurable Intelligent Surfaces.
Interference mitigation	AI can be used to recommend optimal parameters for an individual base station or access point according to its specific local environment, mitigating the impact of the station's surroundings (and other sites) on wireless service quality and matching the configuration dynamically to the current traffic conditions.

[29] https://www.telkomsel.com/en/about-us/news/telkomsel-transforms-operations-and-product-offerings-google-clouds-enterprise-gen-ai

[30] https://stories.thinkingmachin.es/wealth-detection-satellite-image/

[31] Beamforming is the technique of focusing wireless signals in a particular direction, rather than radiating in multiple directions, to improve the end-users connectivity experience.

[32] https://pubmed.ncbi.nlm.nih.gov/37177563/

Some vendors and operators are already exploring how AI can boost the capabilities of wireless networks, as summarised in Figure 3.7.

Figure 3.7: How vendors and operators use AI for wireless network enhancement
[Source: Analysys Mason, 2025]

Example	Description
Faster and more reliable speeds	Nokia's Spectral Performance Management solution helped to achieve a 17% increase in spectral efficiency for Hutchison 3 Indonesia, resulting in higher-quality mobile broadband for subscribers, with faster data speeds and a more reliable service.[33]
Optimising radio network parameters	Ericsson's AI-based network optimisation solution, a part of its managed services offering, was used to enhance spectrum efficiency and throughput for KDDI by optimising radio network parameters.[34]
Radio network optimisation	AT&T and Nokia successfully trialled Nokia's near-real-time RAN Intelligent Controller (RIC) platform and xApps on AT&T's network, which uses AI/ML capabilities and will enable next-generation 5G use cases such as dynamic targeted radio network optimisation.[35]
RAN modernisation and automated network configuration	Globe Telecom is using Cellwize's AI-powered CHIME platform to establish a framework for radio access network (RAN) automation and modernisation. This implementation enables increased visibility and control of the network, automated network configuration and improved customer experience.[36]
Enterprise use of AI for wireless optimisation	REWE retail group was experiencing a large dependency on wireless client connectivity, and found that the complexity of modern enterprise networks was placing an increased workload on employees. After installing Cisco's AI Network Analytics, REWE observed that the AI-driven network automation facilitated optimised network performance, reduced workload on employees for network troubleshooting and provided better visibility of wireless device activity.[37]

3.8 Energy consumption optimisation

Our final use case of AI in communications networks is the optimisation of energy consumption. Again driven by the data available from the network, AI can support energy consumption optimisation, while maintaining high-quality service delivery to end consumers, in the following ways:

- AI can use network traffic analysis to analyse and predict when network demands will be lower and power down equipment (and supporting functions like cooling) accordingly.
- AI could be used to route traffic through those network nodes which are served by lower carbon intensity electricity (e.g. for multi-country networks, traffic can be routed through countries with a higher proportion of renewable energy).[38]

[33] https://www.nokia.com/about-us/news/releases/2018/11/05/nokia-ava-helps-hutchison-3-increase-network-efficiency-and-improve-the-customer-experience-in-indonesia/

[34] https://www.ericsson.com/en/news/2019/6/kddi-boosts-network-performance-with-ai

[35] https://www.nokia.com/about-us/news/releases/2023/03/20/nokia-and-att-leverage-advanced-intelligence-of-the-open-ran-compliant-near-real-time-ran-intelligent-controller-with-native-e2-in-successful-trial/

[36] https://www.prnewswire.com/news-releases/globe-partners-with-cellwize-and-amdocs-to-migrate-automated-network-configuration-to-the-cloud-301513639.html

[37] https://blogs.cisco.com/networking/rewe-retail-group-discusses-business-value-of-ai-ml-in-enterprise-networking

[38] https://eng.ox.ac.uk/media/jwpbeeab/elzahr23benefits.pdf

- The use of AI may also be more energy efficient than conventional computing techniques, for example in the signal processing functions of wireless networks.[39]

Energy consumption savings positively affect operators' finances and contribute to minimising carbon emissions. As the communications industry supports almost all other sectors, reducing carbon emissions in communications will help to decrease carbon emissions across the value chains of other sectors. There are several examples of AI-enabled energy consumption optimisation gains for communications networks, as summarised in Figure 3.8.

Figure 3.8: How network providers use AI to optimise energy consumption
[Source: Analysys Mason, 2025]

Example	Description
Automatic shutdown of idle equipment	Globe Telecom in the Philippines complemented its energy savings programme with an AI-based solution for shutting down idle equipment, leading to a 3–6% reduction in energy usage.[40]
'Cell sleep' technology	BT has deployed 'cell sleep' technology that saves energy at EE network sites by shutting down 4G LTE capacity carriers when capacity is not needed. Capacity requirements are predicted for each site by ML models. This technology is expected to save 2kWh per site per day or 4.5 million kWh per annum across EE's entire estate.[41]
Intelligent use of energy in network sites	Ericsson's new solution for energy efficiency in network sites uses AI-powered RAN applications and data interfacing between the RAN and power grids to optimise daily energy consumption patterns. Energy is only channelled to cell sites when and where required, optimising operations while reducing costs. Three UK reported that implementation of this solution, together with the deployment of Ericsson's energy-efficient radios, improved energy efficiency by up to 70% at selected sites.[42,43]
Vendor energy efficiency proposition	Nokia's AVA Energy Efficiency is an AI-driven energy management solution that minimises the energy consumption of RAN equipment by facilitating dynamic shutdowns of unused network elements during low-traffic periods. This solution is reported by Nokia to reduce up to 30% in energy savings, without negatively affecting performance or customer experience.[44] Deployment of this software for Safaricom Kenya is expected to result in network energy cost savings of 8–10%.[45]
'Sleep mode' technology	Deutsche Telekom recently launched an energy-saving AI RAN trial, which integrates AI into its RAN and uses dynamic "sleep mode" solutions to automatically switch off parts of the network during quiet periods, with the aim of increasing the network's energy efficiency.[46]

[39] "AI/ML-based physical layer solutions can enhance the energy efficiency of 6G networks by achieving as much as a 50% reduction in transmit power over 5G for the same bandwidth and data rate." https://www.nokia.com/bell-labs/research/6g-networks/6g-technologies/ai-native-air-interface/

[40] https://developingtelecoms.com/telecom-technology/energy-sustainability/15826-globe-uses-nokia-s-energy-efficiency-saas-to-save-power-costs.html

[41] https://newsroom.bt.com/bt-group-rolls-out-energy-saving-cell-sleep-technology-to-ee-mobile-sites-nationwide/

[42] https://www.ericsson.com/en/news/2024/6/ericsson-unveils-new-solution-for-intelligent-use-of-energy-in-network-sites

[43] https://www.ericsson.com/en/press-releases/3/2024/three-uk-and-ericsson-set-the-standard-for-smart-and-sustainable-networks

[44] https://www.nokia.com/networks/bss-oss/ava/energy-efficiency/

[45] https://www.mobileeurope.co.uk/safaricom-kenya-choses-nokias-ava-energy-efficiency-for-3g-4g-and-5g/

[46] https://www.ukfcf.org.uk/deutsche-telekom-launches-energy-saving-ai-ran-trial/

4

Barriers to adoption must be solved to realise the benefits of AI in networks

Despite the benefits of AI applications in communications networks highlighted in the previous section, there are barriers that need to be overcome before the full potential of AI in networks can be realised. These barriers are discussed in this section.

4.1 Data

The central requirement for all types of AI application is exposure to data. AI systems need data to learn (so called 'training') and to create results (so called 'inference').

Our research has shown that one of the biggest barriers to AI adoption by connectivity providers is effective access to data (and the quality of the data that is available).

While communications networks are rich sources of data, their existing data architectures are not built to capitalise on the potential of AI because they:[47]

- do not support the execution of analytic workflows and the delivery of insights in real time
- are highly siloed and fragmented, and so do not provide unified exposure of data for the creation and operations of network AI models
- require significant resource to access and prepare data, even before it can be used by AI
- are not scalable and cost efficient to store growing data volumes and support advanced analytics and AI functions, because they run 'on premises'.

These issues may be compounded by a complex landscape of legacy IT systems, and a lack of centralised understanding of how these systems and data stores relate to each other. Previous business decisions made to support business growth and to seize specific opportunities may now hinder, rather than facilitate, an organisation's ability to gain value from AI.[48, 49]

4.2 Trust

Trust is a potential issue within the 'critical infrastructure' mindset of connectivity providers, which manifests two potential sub-issues:

- Concerns over network configuration integrity: with network teams reluctant to allow AI to influence the operation of their systems (e.g. by recommending network parameters, or other network-related decisions).
- Concerns over security: including concerns over AI models from third-party external environments being allowed to work on data which is internal to the network provider.

[47] https://www.analysysmason.com/contentassets/14b9fdedcb94457dbb43f97f15da2369/analysys_mason_csp_architecture_network_oct2023_rma14.pdf

[48] https://www.analysysmason.com/about-us/news/predictions-2025/ai-business-transformation/

[49] As an indication, the Cisco AI Readiness Index found that less than a third (32%) of survey respondents from a broad range of sectors report high readiness from a data perspective to adapt, deploy and fully use AI technologies. https://www.cisco.com/c/m/en_us/solutions/ai/readiness-index.html

Any disruption in service is typically highly publicised, and is highly damaging to customer opinion and the wider reputation of the network provider. There may also be concerns about the location, security and handling of data, if the AI capability is provided by a third party.[50]

Furthermore, due to their lack of trust in AI, many operators are using a "watch and wait" approach, finding it difficult to adopt AI technology while the capabilities and use cases are expanding so rapidly.

Cisco, a provider of AI-enabled analytics services, explained that it sees a lot of caution in its customers using AI, with only a small proportion being trusting enough to use predictive AI capabilities in their networks.[51]

4.3 Skills

Related to the points above, communications network providers tend to be staffed by network experts, not data scientists and code debuggers. Their networks are generating data at an increasing rate, and they need to develop new techniques to take advantage of the insights that this data contains. But communications networks providers may not have enough of the right sort of skills to capitalise on the opportunity.[52] Furthermore, existing governance teams will need to consider new types of issues, including whether any deployment of AI is done in a secure and responsible manner.

4.4 Budget

Deployment of any new technology by an organisation requires investment, and must be shown to provide positive return on investment (ROI) to be approved by senior management. Some communications network providers are struggling to demonstrate a positive ROI for AI deployments, due to the large up-front costs and uncertainties over the magnitude of any potential benefits to network operations. This may be especially challenging when the network provider is under pressure to make other investments in network and IT infrastructure.

4.5 Regulation

Existing and proposed AI regulation could be creating barriers to the adoption of the technology by communications network providers, which may be considered to be providers of critical national infrastructure, especially as it may overlap with other regulatory frameworks (e.g. data,[53] cloud, cyber security, telecoms, energy). Such regulation may be creating barriers both explicit (e.g. by imposing a significant reporting and governance burden on the use of AI) and implicit (e.g. because it is not clear how or whether the regulations can be met).

[50] Any network operator seeking to benefit from the capabilities of cloud services may encounter similar issues.

[51] Source: interview as part of research for the project.

[52] As an indication, the Cisco AI Readiness Index found that only 31% of organisations from a broad range of sectors claim that their employees are in a high state of readiness to fully leverage AI, and nearly a quarter (24%) of survey respondents say that their organisations are under-resourced in terms of in-house staff necessary for successful AI deployment.https://www.cisco.com/c/m/en_us/solutions/ai/readiness-index.html

[53] In Cisco's 2024 Data Privacy Benchmark study, 86% of organisations say that global providers are better able to protect their data compared with local providers. This may be an important consideration when policy makers are considering data regulations that limit choice to local providers. https://www.cisco.com/c/en/us/about/trust-center/data-privacy-benchmark-study.html#~about-the-study

5

Policy makers have a range of tools to encourage the adoption of AI in networks

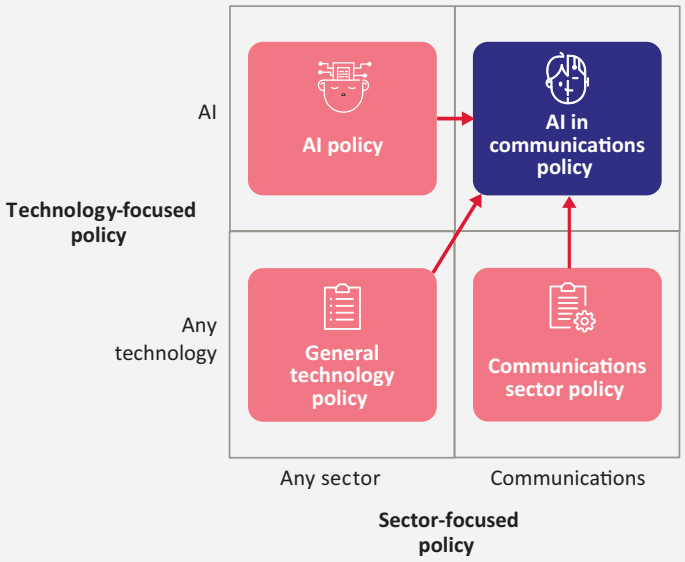
In the preceding sections, we initially explored the various benefits that AI can bring to communications networks, and subsequently highlighted several barriers that may be holding back AI implementation. In this section, we present a range of tools that policy makers can use to help overcome these barriers and realise the benefits of AI in communications.

Some jurisdictions (whether national or regional) already have some form of AI-related, and/or communications-related, policies. There is an opportunity for policy makers to bring these elements together, to define policy specifically for AI in communications, because:

- communications networks are a critical foundation of all digital transformation goals; and
- the high-tech nature of communications makes it a natural first step for more sector-specific AI policy actions, which can lead the way for implementation in other sectors.

Existing policy can be tailored to focus on AI in communications, as shown in Figure 5.1.

Figure 5.1: Illustration of how existing policy can be targeted at AI in communications
[Source: Analysys Mason, 2025]



Overall, the priority of policy makers should be ensuring that populations continue to enjoy the benefits of digital connectivity, whilst ensuring that the communications sector remains a healthy and thriving industry.

In the following sections, we discuss recommendations for policy makers under four high-level themes: engage, facilitate, implement and intervene. These themes are designed to give a framework of actions to inform a comprehensive policy strategy for AI in communications.

5.1 Engage: continual assessment of industry status

Policy makers have an important role in providing leadership and guidance to industries to support positive economic growth and societal outcomes. If policy makers demonstrate interest and confidence in a new technology, then industry stakeholders will also feel more confident in implementing that technology. Such activities can be helpful in tackling some of the trust issues that are apparent in communications network teams today.

A useful first step would be for policy makers to set up a market monitoring function to monitor and publish developments in AI for the communications space. This monitoring should include developments from their own jurisdiction, and also from other jurisdictions, so that best practice from across the globe can be highlighted. This activity is also a critical foundation for other policy activities, to make sure that further actions are tailored to the current and future status of this rapidly changing area.

Figure 5.2 shows examples of AI market monitoring initiatives, though these are not specific to communications. There is an opportunity to focus these initiatives on the intersection of AI and communications, or to take lessons from these examples in setting up new dedicated initiatives.

Figure 5.2: Examples of AI market monitoring initiatives [Source: Analysys Mason, 2025]

Example	Description
Analytical study of the AI sector	• The UK government commissioned an analytical study of the AI sector in 2022, in line with the aims of the National AI strategy to strengthen the UK's role as a global AI leader. • Another study was commissioned in 2023 to assess the changes and developments since the previous study. • The study served to increase understanding of the sector, enable the government to monitor AI developments over time and evaluate interventions to best support sector growth.[54]

[54] https://www.gov.uk/government/publications/artificial-intelligence-sector-study-2023/artificial-intelligence-sector-study-2023

Example	Description
Monitoring of Critical and Emerging Technologies	• The Critical and Emerging Technologies (CETs) list was produced to highlight advanced technologies that are potentially significant to US national security. • The list is intended to be used to inform future efforts that promote technological leadership, advance and maintain technological advantages, develop, design and govern CETs in a beneficial manner for society and develop measures to respond to threats to US security. • AI is listed as a CET. Subfields within AI that are listed include: ML; DL; reinforcement learning; sensory perception and recognition; AI assurance and assessment techniques; foundation models; GenAI systems and LLMs; synthetic data approaches for training, tuning and testing; planning, reasoning and decision making; technologies for improving AI safety, trust, security and responsible use.[55]
Annual white paper on information and communications	• This white paper is released annually by the Ministry of Internal Affairs and Communications in Japan, with the aim of highlighting the current state of information and communications in Japan and related policy trends in telecoms. • The precise focus of each paper differs annually, but the general tracking and monitoring of developments in communications (including AI) and policy trends is consistent. • The 2023 edition outlines advancements in the field of AI, namely GenAI, and uses this to guide policy initiatives around data utilisation (e.g. develop an AI usage environment).[56]

Policy makers should establish a dedicated market monitoring function, covering developments in AI for communication in both their own jurisdiction and those from elsewhere. The function should consider both current and future trends, and gather intelligence via multiple methods (e.g. desk research, professional advisers, interviews and conversations, conferences). Policy makers should aim to engage with multiple stakeholders as part of the monitoring (and as a foundation for the next action), across industry, academia and other policy makers. Regular outputs should be created (e.g. an annual report or white paper). This activity forms a critical foundation for other policy actions. Furthermore, publishing this analysis will help to provide some confidence in the use of AI for all communications network providers, helping to address issues of trust.

5.2 Engage: convene industry stakeholders

Building on the monitoring activity in the first recommendation, policy makers can play an important role in convening communications industry stakeholders, to share knowledge and best practice as they progress the deployment of AI for communications networks. Policy makers are ideally suited to bring together a wide range of different stakeholders, including themselves (both governments and regulators), network providers, technology vendors, representatives of end users and academics. Once formed, these stakeholder networks can meet on a regular basis to discuss lessons learnt and success stories on their AI journeys.

[55] https://www.govinfo.gov/content/pkg/CMR-PREX23-00185928/pdf/CMR-PREX23-00185928.pdf

[56] https://www.soumu.go.jp/johotsusintokei/whitepaper/eng/WP2023/pdf/00_fullversion.pdf

As shown in Figure 5.3, there are some examples of initiatives to convene technology industry stakeholders. As with many of the other areas of policy recommendation in this section, where initiatives exist, they should be tailored to focus on the intersection of AI and communications. Where they do not exist, they should be created.

Figure 5.3: Examples of initiatives to convene technology industry stakeholders
[Source: Analysys Mason, 2025]

Example	Description
The UK Telecoms Innovation Network (UKTIN)	The UKTIN is a network formed in 2022 which is funded by a UK government department, and serves to bring together various stakeholders across the UK telecoms sector, including academics, government stakeholders, regulatory bodies and industry experts. The network convenes expertise across various specialisms to promote collaboration between different organisations, with a goal to transform the telecoms innovation landscape and shape the delivery of government policy based on the needs of all parties.[57]
Telecoms Supply Chain Diversification (TSCD) Advisory Council	The TSCD Advisory Council is a committee of members which provide advice to the UK government regarding telecoms diversification, specialising in the implementation of the 5G Supply Chain Diversification Strategy. The Council will advise on priorities, opportunities and challenges related to diversification, provide a forum for dialogue between various stakeholders and share relevant research and expertise with the government.[58]
National Telecommunications and Information Administration	The NTIA is the Executive Branch agency within the US Department of Commerce which advises the President on telecoms and information policy.[59] The NTIA establishes advisory committees, such as the Commerce Spectrum Management Advisory Committee,[60] which bring together stakeholders across governments, technology developers, academia, service providers and customers in order to provide advice on relevant policy issues.
Trusted Information Sharing Network (TISN)	The TISN is an initiative introduced by the Australian government which convenes a wide range of industry stakeholders to enhance the security and resilience of critical infrastructure. Stakeholders brought together by the TISN include telecoms operators, academics, research institutes, supply chain entities and government bodies. The TISN's activities include online webinars, site visits and in-person workshops to build awareness, implement appropriate strategies and inform future policy in this area.[61]

[57] https://uktin.net/about/strategic-groups

[58] https://assets.publishing.service.gov.uk/media/6440f2388b86bb0013f1b610/Telecoms_Diversification_Advisory_Council_-_Terms_of_Reference.pdf

[59] https://www.ntia.gov/page/about-ntia

[60] https://www.ntia.gov/sites/default/files/csmac_charter.pdf

[61] https://www.cisc.gov.au/how-we-support-industry/partnership-and-collaboration/trusted-information-sharing-network

Example	Description
GovTech's industry collaboration initiative	GovTech is the lead agency responsible for driving the Smart Nation initiative in Singapore.[62] GovTech's initiatives include collaborations with government bodies to facilitate digital government transformation, as well as collaboration and engagement with industry stakeholders to refine processes and share best practices. Collaboration events include closed-door discussions with industry partners and public-private collaborative events to spur innovation, such as the AI Trailblazer event which aimed to spur AI adoption.[63]

Policy makers should convene industry stakeholders to share knowledge and best practice, including lessons learnt and success stories, on their journeys to implement AI in communications networks. These stakeholders should include governments, regulators, network providers, technology vendors, end-user representatives and academics. Policy makers should define the structure of the convened stakeholders, potentially into specific sub-groups that can focus on different elements of AI in communications. Groups should be multi-stakeholder, open and inclusive, to create an environment for effective knowledge sharing. Each group should meet regularly (e.g. quarterly) online and in person, and have a clearly defined remit and/or goals for what research, thinking and/or advice is being developed. Outputs could include an inception document and regular (e.g. annual) update reports. This activity will foster collective confidence among stakeholders (addressing trust issues), while the sharing of knowledge and success may help to tackle problems with data management and securing budget.

5.3 Facilitate: guidance on best practice

Building on the monitoring and convening activities in the previous two recommendations, one of the best 'levers' that policy makers have to shape the evolution of markets is to provide guidance on best practice. This guidance should be based on an in-depth analysis of the issues associated with particular use cases and/or barriers. Some initial ideas for where best-practice guidance could be developed include:

- Guidance on data management in the context of *network anomaly detection:* to alleviate issues with the collection, storage and processing of data, which is critical to realise the full benefits of this use case.
- Guidance on risk management in the context of *configuration fidelity:* to alleviate the issues with trust which may be present in some network teams, and may be holding back the deployment of this use case.

A number of policy initiatives seek to promote effective use of AI, sometimes also including data management, as shown in Figure 5.4. These initiatives could be adapted to focus on communications networks (or provide inspiration for new initiatives).

[62] https://www.tech.gov.sg/about-us/who-we-are/

[63] https://www.tech.gov.sg/products-and-services/collaborate-with-us/industry-collaboration/

Figure 5.4: Examples of initiatives to provide guidance on AI best practice
[Source: Analysys Mason, 2025]

Example	Description
Pro-innovation approach to AI regulation and provision of guidance	In March 2023, the UK government proposed its pro-innovation approach to AI regulation.[64] This regulatory framework sets out five principles which apply to the UK's existing regulators, providing them with guidelines to apply within their sector-specific remits. The UK's 2025 AI Opportunities Action Plan also contains recommendations for the government to: issue guidance on best practice on releasing open government datasets to be used for AI, including data dissemination methods; ensure sponsor departments issue guidance to regulators with a focus on enabling safe AI innovation; and issue guidance on best practice, as well as case studies and results, through a single 'AI Knowledge Hub'.[65]
Model AI Governance Framework for Generative AI	This framework, developed by the regulator in Singapore, encourages AI developers to undertake data quality control measures to expand the pool of trusted, high-quality datasets. The framework also promotes the importance of third-party testing and assurance, as well as transparency in approaches and methodologies used in model development.[66]
AI Risk Management Framework	The US AI Risk Management Framework is a voluntary framework for AI designers, developers and deployers to aid the understanding, management and mitigation of the risks of AI systems. The framework outlines the various risks related to AI, and highlights four key mechanisms by which organisations can address AI risks in practice: govern, map, measure and manage. Central to each of the four actions is the focus on improving the trustworthiness of AI systems.[67]
Voluntary AI safety standard	The Australian Department of Industry, Science and Resources set up a Voluntary AI Safety Standard to promote consistent AI best practices when developing and using AI. The standard contains 10 guardrails, which apply to all organisations throughout the AI supply chain, to provide guidance on the safe and responsible use of AI. The guardrails include establishing accountability, risk management and data governance measures, as well as promoting transparency, human intervention and testing and evaluation.[68]
Advancing the development and adoption of AI standards	The Pan-Canadian National AI Strategy contains three pillars, one of which is the development of AI standards. The Government of Canada is supporting the Standards Council of Canada in efforts to promote the development and adoption of AI standards ensuring the responsible and safe use of AI, whilst also aligning with Canada's priorities to support the Canadian economy.[69] CAD8.6 million will be provided to the Standard Council of Canada to advance the development of these standards, as well as a conformity assessment programme related to AI.[70]

[64] https://www.gov.uk/government/publications/ai-regulation-a-pro-innovation-approach/white-paper#part-3-an-innovative-and-iterative-approach

[65] https://www.gov.uk/government/publications/ai-opportunities-action-plan/ai-opportunities-action-plan

[66] AI Verify Foundation and Infocomm Media Development Authority (2024), https://aiverifyfoundation.sg/wp-content/uploads/2024/05/Model-AI-Governance-Framework-for-Generative-AI-May-2024-1-1.pdf

[67] National Institute of Standards and Technology, U.S. Department of Commerce (2023), *Artificial Intelligence Risk Management Framework (AI RMF 1.0)*.

[68] https://www.industry.gov.au/sites/default/files/2024-09/voluntary-ai-safety-standard.pdf

[69] https://ised-isde.canada.ca/site/ai-strategy/en#pillar2

[70] https://www.canada.ca/en/innovation-science-economic-development/news/2022/06/government-of-canada-launches-second-phase-of-the-pan-canadian-artificial-intelligence-strategy.html

Policy makers can play a facilitating role and help to develop 'soft' instruments to *encourage* implementation of AI in communications, rather than setting *requirements* for how AI should be implemented. There are two broad types of instrument:

- *Frameworks*, which include guiding principles of best practice, developed from success stories within industry.
- *Standards*, which should be used sparingly to avoid constraining innovation, but may be important for interoperability between different technologies and vendors.

These instruments should be developed across the key themes of successful AI implementation, which are: security (including security by design), safety and risk management, data management, transparency and accountability. This area of initiative will help to directly tackle some of the key barriers to adoption of AI in communications, including issues with data management and trust.

5.4 Facilitate: ensure AI skills are available for communications, now and in the future

The lack of appropriate skills within providers of communications networks is a potential barrier to the successful implementation of AI. Skills that are likely to be needed include those around general AI literacy, data science and management, and more specific AI-related skills like prompt engineering.[71] Policy makers typically have a role in promoting skills development, and there are some examples of policies relating to developing AI skills (see Figure 5.5). Some skills initiatives will take time to come to fruition, so policy makers should consider a range of immediate actions, including mapping the skills that will be needed by communications providers, attracting currently available skilled resources (e.g. from other countries and/or sectors), and setting in motion skills development for the future (e.g. AI training in schools and later education).

Figure 5.5: Examples of policy initiatives to develop AI skills [Source: Analysys Mason, 2025]

Example	Description
National Artificial Intelligence Strategy	A key action outlined in the Singapore National Artificial Intelligence Strategy 2.0 is the implementation of AI training programmes, with the aim of boosting the AI practitioner pool to 15 000. Initiatives in this category include redesigning the AI Apprenticeship programme to increase the number of apprentices trained, implementing pre-employment training to scale up the AI talent pipeline and encouraging sector leads to develop appropriate AI training programmes to help workers acquire the relevant skillsets needed for AI.[72]

[71] https://www.cisco.com/c/dam/m/ai-enabled-ict-workforce-consortium/report.pdf

[72] Smart Nation Singapore (2023), https://file.go.gov.sg/nais2023.pdf

Example	Description
Smart Nation Initiative	The Singapore Smart Nation 2.0 initiative is an updated report summarising Singapore's key efforts to harness digital technologies to improve the lives of citizens. Included within these efforts is a strong emphasis on AI training; Singapore aims to triple its AI practitioner pool over the next five years, with support from an investment of over SGD20 million which will be used to enhance AI practitioner training for students, and offer AI scholarships and internships. AI upskilling opportunities will be offered to recent graduates, AI-specific courses will be offered to those with job roles affected by AI and AI modules will be offered in both primary and secondary schools to strengthen students' AI skills.[73]
Subsidising of AI training costs	The UK Department for Science, Innovation and Technology announced a GBP7.4 million pilot scheme to subsidise the cost of AI skills for SMEs, promoting investment by employers in AI training.[74]
Support to businesses to integrate AI	The Australian government has announced AUD101.2 million of funding will be used to support businesses to integrate AI and quantum technologies into their operations. Of this amount, AUD41.2 million is specifically allocated to AI, aimed at supporting responsible deployment and funding businesses to support SMEs with no AI expertise to adopt AI technologies.[75]
AI graduate training programme	Australia's AI Action Plan outlines a direct action to boost AI talent by training AI graduates. AUD24.7 million will be provided through the Next Generation AI Graduates programme to offer at least 234 targeted scholarships and train AI students on relevant industry projects. These graduates will help to expand the pool of AI specialists, addressing the current shortage.[76]
Funding support for AI research and talent	The second phase of the Pan-Canadian National AI Strategy is centred around enhancing Canada's AI research base and talent pool. CAD160 million in funding will be provided to the Canadian Institute for Advanced Research (CIFAR) to promote the development of academic research talent and maintain training centres in the national AI institutes. An additional CAD48 million will be provided for CIFAR to upgrade its advanced training and knowledge mobilisation programmes, and CAD40 million will be funded to provide dedicated computing capacity for AI researchers.[77]

[73] Smart Nation Singapore and Ministry of Digital Development and Information (2024), https://file.go.gov.sg/smartnation2-report.pdf

[74] https://www.gov.uk/government/publications/flexible-ai-upskilling-fund/ai-upskilling-fund-application-guide

[75] https://www.industry.gov.au/news/investments-grow-australias-critical-technologies-industries

[76] https://wp.oecd.ai/app/uploads/2021/12/Australia_AI_Action_Plan_2021.pdf

[77] https://www.canada.ca/en/innovation-science-economic-development/news/2022/06/government-of-canada-launches-second-phase-of-the-pan-canadian-artificial-intelligence-strategy.html

Policy makers should consider the need for AI-related skills among communications network providers to effectively overcome any associated barriers. Policy makers should start with a mapping of what skills are needed and where, within communications providers in their jurisdiction. Immediate actions to help with the issues associated with current skills shortage include government-supported training programmes and promoting the benefits of AI training to network providers. Financial incentives, such as tax benefits, could also be provided. Actions for the future could include ensuring that university courses feature the confluence of AI and connectivity, i.e. AI courses include communications modules and electronic communications courses include AI. And finally, it is likely to be good practice to publish the budgets set aside for skills development, as it demonstrates a strong commitment to the industry.

5.5 Implement: effective targeting of R&D programmes

Government-funded research and development (R&D) programmes are a well-established method for policy makers to support the development of new technologies. They allow new technologies and techniques to be investigated, with the government assuming part of the commercial risk. Government-funded R&D is well suited to exploring how AI can be successfully implemented in communications networks and the outputs can feed into other policy action areas, such as guidance on best practice and the need for new skills.

Similar to other policy areas, existing R&D programmes may benefit from tailoring to address the specific integration of AI in communications. Some examples of general-AI R&D programmes are given in Figure 5.6, while examples of communications-focused R&D programmes are given in Figure 5.7.

Figure 5.6: Examples of existing R&D programmes focusing on AI [Source: Analysys Mason, 2025]

Example	Description
Smart Nation initiative	The Singapore Smart Nation 2.0 initiative includes the intention to invest up to SGD120 million as part of an 'AI for Science' initiative.[78] The fund is expected to support the development of new tools and techniques that can be applicable across a wide range of scientific domains.[79]
National Artificial Intelligence Initiative Act	The US National Artificial Intelligence Initiative Act asks the National Science Foundation (NSF) to fund AI-related research and education activities. The NSF should engage with other institutions to share knowledge and identify emerging AI research needs, ensure sufficient access to research infrastructure for AI systems and conduct AI research funded through existing NSF programmes. The NSF should also award grants for AI research within a number of specified areas, including research related to machine learning, AI-enabled systems, research that will advance AI systems or that will contribute towards the development of trustworthy AI.[80]

[78] Smart Nation Singapore and Ministry of Digital Development and Information (2024), https://file.go.gov.sg/smartnation2-report.pdf

[79] https://www.crnasia.com/news/2024/ai/ai-at-the-core-of-singapore-smart-nation-2-0-strategy

[80] 116th Congress (2020), https://www.congress.gov/bill/116th-congress/house-bill/6216

Example	Description
National Science Foundation investment in AI research	The US National Science Foundation Directorate for Engineering invests in AI-related research. In this initiative, the Directorate is encouraging the submission of proposals for all types of research and education related to AI.[81]
Multi-country research funding	Horizon Europe is the primary EU research funding programme, which allocated EUR2.6 billion to AI R&D in 2021–2022.[82] More recently, a new set of calls were launched in April 2024 to provide funding of up to EUR112 million towards research in AI and quantum technologies.[83]
Research to improve economic productivity	UK Research and Innovation is sponsoring 98 projects using AI to improve productivity across the economy. Amongst these are projects in the construction, healthcare, transport, manufacturing and retail industries.[84]
Funding support for AI research projects	The Australia AI Action Plan outlines several programmes providing funding for AI research projects, including the Cooperative Research Centres Projects programme, which offers funding for short-term research to develop new technologies such as AI, and the Australian Research Council Linkage programme which promotes research partnerships involving AI. Additionally, AUD20 million has also been provided to establish the Centre for Augmented Reasoning at the University of Adelaide, to support AI research through PhD scholarships.[85]
EU Competitiveness Compass	The 2025 EU Competitiveness Compass contains several R&D initiatives to boost competitiveness by closing the innovation gap in new technologies. Such initiatives include: the AI Continent Strategy, part of which will focus on the establishment of AI factories dedicated to research for developing and improving AI models; the European Innovation Act, which will enable innovative companies to access European research and technology infrastructure; and the European Research Area Act, which will strengthen R&D investment and focus research support more on strategic priorities.[86]
EU InvestAI initiative	In 2025, the EU launched the InvestAI initiative, to mobilise EUR200 billion for investment in artificial intelligence. The initiative includes a EUR20 billion fund for AI gigafactories, which will specialise in training the most complex AI models, using around 100 000 of the latest AI chips. InvestAI also includes a layed approach to funding, which aims to reduce the risk faced by other investment partners.[87]

[81] https://www.nsf.gov/funding/opportunities/dcl-funding-opportunities-engineering-research-artificial

[82] https://digital-strategy.ec.europa.eu/en/policies/european-ai-research

[83] https://digital-strategy.ec.europa.eu/en/news/new-horizon-europe-funding-boosts-european-research-ai-and-quantum-technologies

[84] https://www.ukri.org/news/ai-projects-backed-by-32-million-to-turbocharge-productivity/

[85] https://wp.oecd.ai/app/uploads/2021/12/Australia_AI_Action_Plan_2021.pdf

[86] European Commission (2025), https://commission.europa.eu/document/download/10017eb1-4722-4333-add2-e0ed18105a34_en

[87] https://ec.europa.eu/commission/presscorner/detail/en/ip_25_467

Figure 5.7: Examples of existing R&D programmes focusing on communications
[Source: Analysys Mason, 2025]

Example	Description
6G research, trials and innovation	The EU Smart Networks and Services Joint Undertaking is funding EUR130 million towards 27 projects focused on 6G research, trials and innovation.[88]
Research into space-based communications	The UK Space Agency is investing GBP10 million to boost innovation in telecoms services, ranging from satellite components to ground network systems. This is a funding competition in which applicants will bid for investment. The competition supports projects by UK companies, enabling them to broaden their range of innovative products, components, systems or services.[89]
5G testbed and trials programme	The 5G Testbeds and Trials programme is the UK government's nationally co-ordinated programme of investment in 5G. This programme funded the integration of three university 5G testbeds to provide the UK's first end-to-end 5G network. The 5G programme is also providing GBP30 million in funding to diversify the supply market for radio equipment, GBP1.6 million towards a neutral host Open RAN testbed and up to GBP4 million of R&D funding to projects exploring pilots to connect the hardest-to-reach areas of the UK.[90]

Government-sponsored R&D programmes focusing on AI in communications are an effective way to explore new technologies and techniques while mitigating commercial risk. This technique can tackle multiple barriers, including those associated with data, trust and budget. When creating an R&D programme focused on AI in communications, policy makers first need to define the overall goals of the funding. These goals could be linked to how that funding is spent: funding of AI infrastructure to support innovative and unconstrained research, funding available for partnerships and collaborations (including universities), and funding of research into specific AI tools and techniques. Furthermore, project award criteria should be clearly defined to select projects according to the goals of the programme. Just as with skills development, policy makers should consider clearly publishing the budget set aside for such R&D programmes. This transparency can attract applications for funding and demonstrate the commitment of policy makers to AI in communications.

5.6 Implement: use of AI in government networks

The beneficial AI-enabled applications described above are applicable to both operators of fixed and mobile telecoms infrastructure, and to organisations that overlay their own networks on this infrastructure. Many governments and their departments operate their own networks, which provides an opportunity for them to implement AI in those networks. This would allow governments to apply some of the insights and best practices gained from their involvement in the initiatives recommended above, and to show leadership in the implementation of AI for communications.

[88] https://digital-strategy.ec.europa.eu/en/news/6g-research-gets-eu130-million-eu-funding-boost-europe

[89] https://www.gov.uk/government/news/new-funding-to-put-the-uk-at-heart-of-next-generation-telecommunications-services

[90] https://www.gov.uk/guidance/5g-testbeds-and-trials-programme

There are several examples of governments welcoming the use of certain technologies by their departments, including 'cloud first' policies (promoting the use of cloud services) and some examples that consider the use of AI (see Figure 5.8). There is an opportunity for governments to build on such policies and deploy AI in their networks.

Figure 5.8: Examples of policies to manage use of AI by government [Source: Analysys Mason, 2025]

Example	Description
Policy for safe and responsible AI in government	This policy from the Australia Digital Transformation Agency aims to ensure that the government plays a leading role in embracing AI to benefit Australians, whilst also ensuring safe, ethical and responsible use of the technology. This includes providing a unified approach for government use of AI, strengthening public trust in government use of AI and putting forward an adaptive approach that is designed to develop over time. The policy includes mandatory requirements (e.g. designate accountability for implementation of the policy, engage in whole-of-government forums), recommended actions (e.g. implement AI fundamentals training for all staff), and actions to consider (e.g. develop an internal register of where and how AI is being used within agencies).[91]
AI pilots to address vulnerabilities in government networks	The US Department of Defense and DHS conducted AI pilots to address vulnerabilities in government networks, to enhance national security of vital government systems.[92]
Use of AI to enhance resilience of government network	The US Defense Intelligence Agency (DIA) is in the process of updating the Joint Worldwide Intelligence Communication System (JWICS, the Pentagon secure network) with the aim of increasing resilience to outages. As part of this modernisation process, the DIA is also enhancing the cyber security and automation of the network. AI will be used to help enhance the monitoring of network traffic and automate the identification of anomalies and errors before they cause serious consequences, as well as contribute towards automated network cyber security.[93]
Report on the use of AI in government	The report "Use of AI in Government" by the UK National Audit Office contains survey results highlighting key use cases of AI in the UK government. Amongst these, the top-four use cases were: to support operational decision-making, to support research or monitoring, to improve internal processes and to provide a public service/engage with the public.[94]

The benefits of AI are just as applicable to the networks operated by governments as they are to other network providers. Governments have the opportunity to lead by example by incorporating AI into their networks, building on any policies that already consider the use of AI by government departments, and the AI in communications policy initiatives discussed above. Subject to any concerns over security and sensitive information, government network operators using AI should share the results of AI implementation, either publicly or with trusted industry stakeholders.

[91] https://www.dta.gov.au/news/our-next-steps-safe-responsible-ai-government

[92] https://bidenwhitehouse.archives.gov/briefing-room/statements-releases/2024/10/30/fact-sheet-key-ai-accomplishments-in-the-year-since-the-biden-harris-administrations-landmark-executive-order/

[93] https://breakingdefense.com/2024/10/dia-almost-done-with-jwics-tech-refresh-goal-to-enhance-network-resiliency/

[94] https://www.nao.org.uk/wp-content/uploads/2024/03/use-of-artificial-intelligence-in-government.pdf

5.7 Intervene: incentives to invest

One of the barriers to successful deployment of AI in communications is securing budget for the necessary investment in innovation when the ROI is uncertain or choices have to be made between business priorities. Policy makers have an opportunity to intervene here, by providing incentives to make such investments. There is precedent for these types of interventions (see Figure 5.9), and it is possible that even modest financial support could be enough to tip the balance and unlock more AI deployments.

Figure 5.9: Examples of financial incentives to encourage use of certain technologies
[Source: Analysys Mason, 2025]

Example	Description
Tax relief on fibre networks	The UK Telecommunications Infrastructure Act enabled 100% relief from business rates for operators in England and Wales that install new fibre on their networks.[95]
Tax incentive for construction of 5G systems	A tax incentive was introduced in Japan for the construction of safe and reliable 5G systems. The tax revision involves a 15% tax credit in relation to acquisition cost, or a 30% special depreciation[96] on eligible facilities (e.g. transmitters, receivers, antennas, etc), reducing a company's taxable income to encourage investment.[97,98]
Tax incentive for businesses developing new technologies	The Canada Federal Government introduced the Scientific Research and Experimental Development (SR&ED) tax incentive to reduce payable income tax for businesses engaged in scientific research and experimental development, such as AI/ML, in order to promote R&D. Eligible work must be conducted "for the advancement of scientific knowledge or for the purpose of achieving a technological advancement", and must be a "systematic investigation or search that is carried out in a field of science or technology by means of experiment or analysis". Basic investment tax credit rate is 15% of qualified expenditure (e.g. for large corporations) and the enhanced rate is 35%.[99]
Tax incentives for eligible R&D activities and also for early-stage investors	The Australian government offers two forms of incentive: • 1) R&D tax incentive offers tax offsets for companies engaging in eligible R&D activities (over AUD2.5 billion to over 11 000 businesses each year)[100] • 2) Tax concessions to investors in eligible Early-Stage Innovation Companies Both initiatives are referenced as foundational policy settings in Australia's AI Action Plan.[101]

[95] https://bills.parliament.uk/bills/2014

[96] Special depreciation refers to accelerating the depreciation of the 5G network, which reduces a company's income tax, and therefore its tax liability, encouraging investment

[97] https://globaltradealert.org/intervention/101751

[98] https://www.soumu.go.jp/johotsusintokei/whitepaper/ja/r02/html/nd112340.html

[99] https://www.canada.ca/en/revenue-agency/services/scientific-research-experimental-development-tax-incentive-program/what-are-sred-tax-incentives.html

[100] https://business.gov.au/grants-and-programs/research-and-development-tax-incentive/overview-of-rd-tax-incentive

[101] https://wp.oecd.ai/app/uploads/2021/12/Australia_AI_Action_Plan_2021.pdf

Example	Description
Grant funding and equity finance competition incentive	Innovate UK (UK) piloted several Investment Accelerator Competitions which match grant funding with private equity finance, in order to boost venture capital investment in eligible projects and remove the need to find match funding. The incentive is centred around the provision of funding for a designated proportion of project costs, or a specified investment commitment across a range of early-stage eligible projects in key growth areas, spanning smart infrastructure, advanced manufacturing, connected transport and digital technology.[102]
Blended grant funding and investment incentive for innovation start-ups	The European Innovation Council (EIC) Accelerator is a programme under Horizon Europe offering blended funding support to early-stage companies providing innovative services or products. A combination of up to EUR2.5 million in grant funding and from EUR500 000 to EUR10 million in investment funding is available for projects spanning various sectors, including technology and telecoms.[103,104]

Policy makers should consider the option to provide incentives to invest, such as tax incentives and government-supported finance facilities, to help network providers to improve their business case for AI-related projects and to secure internal budget. Many examples of financial incentives to encourage the use and investment in certain technologies include tax relief, though this can take many forms, including full relief of certain taxes, reduced tax rates, tax credits and accelerated depreciation terms (which would typically reduce tax charges). However, as with other recommendations, it is sensible for policy makers to tie these benefits to specific policy aims, such as the use of the technology developed in the R&D programme, or the deployment of certain AI features that fit with policy goals. Public-backed finance can also improve the viability of AI investment cases, with government-supported banks able to arrange low-cost debt facilities and blended finance.

5.8 Intervene: shape outcomes

AI technology holds immense potential, and while that can include significant benefits, it is important to mitigate any potential harms associated with its use. Some regulators are already issuing binding obligations relating to the use of AI (e.g. oversight, reporting), and these may already be hindering take-up of AI by communications network providers, due to uncertainty over how or if they can be complied with.

But the field of AI, both in communications and elsewhere, is developing rapidly, and regulations should not stifle innovation and hold back some of the potential benefits. An outcomes-based approach is likely to be best, where regulation seeks to mitigate any undesirable results of AI (such as bad decisions or recommendations) rather than the specific technologies or techniques being used.

[102] https://www.gov.uk/government/publications/funding-competition-investment-accelerator-pilot/competition-brief-investment-accelerator-pilot#find-out-if-you-are-eligible-to-apply

[103] https://eic.ec.europa.eu/eic-funding-opportunities/eic-accelerator_en#what-is-the-eic-accelerator-

[104] https://eic.ec.europa.eu/eic-fund/about-eic-fund_en

This type of approach will avoid some of the pitfalls of new technology regulation, such as:

- focusing only on techniques which are well known or well publicised
- mistaking a model's power for its impact
- having to constantly update the specific provisions of a regulation in a rapidly changing business and technical environment.

Where existing regulation has already been issued, it is recommended that efforts are spent in helping the communications industry to meet that regulation, including:

- issuing sector-specific guidance for how that regulation can be met (which may be similar to the best-practice guides recommended above)
- looking for ways to collaborate and harmonise regulatory requirements with other jurisdictions to reduce duplicative compliance burdens
- ensuring that a consultative and iterative approach is used when making any amendments or additions to the regulation.

Any regulation of AI in communications should be outcomes based and forward looking, to avoid erroneously focusing on specific techniques and having to constantly update obligations. Where regulation exists, efforts should be spent on collaborating and harmonising with other jurisdictions, issuing sector-specific guidance on how regulation can be met, and using a consultative and iterative approach to any amendments or additions.

6

Overall conclusions

This paper examined how the use of AI in communications networks can contribute to wider digitalisation, economic and societal goals. AI has broad potential to deliver a range of benefits to the operation and performance of digital communications networks. Despite these benefits, there are barriers to overcome before realising the full potential of AI in communications networks.

There is an opportunity for policy makers to define policy specifically for AI in communications, to help overcome these barriers. We have presented eight recommendations for policy initiatives under four high-level themes: engage, facilitate, implement and intervene:

- Policy makers should first establish a dedicated market monitoring function. This function diligently tracks AI developments in communications both locally and worldwide, gathering intelligence through research, professional advisers, interviews and conferences. By engaging with a diverse array of stakeholders from industry, academia and other policy makers, policy makers lay a solid foundation for future actions. Regular reports and white papers not only provide valuable information but also enhance confidence in the use of AI in communications, proactively addressing trust issues.

- Recognising the power of collaboration, policy makers should then convene industry stakeholders to share knowledge and best practices. These gatherings include governments, regulators, network providers, technology vendors, end-user representatives and academics. Structured into specific sub-groups, these multi-stakeholder discussions foster an environment of effective knowledge sharing. Regular online and in-person meetings, with clearly defined goals, lead to the creation of valuable research and advice. This collective effort not only boosts confidence but also tackles challenges related to data management and securing budgets.

- To further encourage AI implementation in communications, policy makers can help to develop 'soft' instruments such as frameworks and standards. These tools should focus on key themes like security, safety, risk management, data management, transparency and accountability. These actions also help to overcome barriers relating to trust and data management.

- Understanding the importance of AI-related skills, policy makers should map the expertise needed within communications providers. They can address current skill shortages through government-supported training programmes and financial incentives. Looking ahead, they should ensure university courses integrate AI and communications modules. Publishing any government budgets for skills development signals a strong commitment to the industry.

- Government-sponsored R&D programmes are another powerful tool to encourage the use of new AI applications in communications technologies, while mitigating commercial risks. Policy makers should define clear goals for these programmes, whether it is funding new AI infrastructure, fostering partnerships, or researching specific applications. Transparent project criteria and published budgets attract innovative applications, demonstrating a steadfast commitment to AI in communications.

- Leading by example, governments can incorporate AI into their own networks, building on existing policies to foster the use of AI in general, and also on the learnings developed by the actions above. Governments can share their implementation results with trusted stakeholders to encourage other network providers to do the same.

- To directly support AI investments, policy makers can offer incentives like tax relief and government-supported finance facilities. These incentives should be tied to specific policy aims, such as using technology from R&D programmes or deploying certain AI features. These measures will enhance the viability of AI investment cases, helping communications providers to secure internal budget for their investments.

- Finally, policy makers should ensure that any AI-related regulations are outcomes based and forward looking. By avoiding a narrow focus on specific techniques, they can create a flexible regulatory environment. Harmonisation with other jurisdictions, sector-specific guidance and a consultative approach to regulatory updates ensure that the regulations remain relevant and effective.

By implementing these recommendations, policy makers can effectively foster the integration of AI in communications networks, driving innovation and ensuring a secure, efficient and sustainable digital future.

Get in touch

enquiries@analysysmason.com

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