

# 2018 NACI Institutional Review Report

*“I have chatted to Prof de la Rey and the Director-General and I think NACI needs to move towards advising government more broadly on issues of science, technology and innovation. NACI has to take a central role in giving advice and not just to DST. NACI’s work cuts across all Departments. We could look at having an annual plenary meeting of all the Ministers, chaired by the President and including all relevant Ministries. In human resource development for example, I see NACI playing a central role around that. Therefore NACI should be the council of choice for such work in the country.” – Minister of Science and Technology, Mmamoloko Kubayi-Ngubane. Interview with Review Panel on 17 May 2018.*

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*“NACI is an important part of South Africa’s NSI given the role it has been assigned to give independent advice to the Minister and through the Minister to Cabinet on at least an annual basis and to look into a matter that may be referred to it by the Minister. It’s been given an important role via legislation.*

*I had hoped I would work through NACI on the new S&T White Paper to give NACI a greater weight and presence in the systems. I feel it hasn’t been given the space to grow into a fully independent and sufficiently resourced centre, therefore it has not had the opportunity to provide sufficient policy advice as a result. Therefore the draft S&T White Paper changes and expands NACI’s role.” – Former Minister of Science and Technology Naledi Pandor. Interview with Review Panel, 15 May 2018.*

# 1 Executive summary

## 1.1 Introduction

In 2018 a Review Panel was constituted by the current National Council on Innovation (NACI) (2014-2018) to conduct an evaluation of the legislative mandate, strategic objectives and operational performance of NACI. The Review Panel was also asked to make recommendations on future strategic directions for NACI, taking into account the local and international context as well as emerging trends in science, technology and innovation (STI) systems. This institutional review of NACI is the third conducted to date and covers the period 2009-2017. The two previous reviews took place in 2002 and 2008. Certain concerns about NACI's advisory mandate, its structural location and its performance have been highlighted across all three reviews.

Since 1994 a suite of institutions has been put in place as part of the development of the South African National System of Innovation (NSI). Many of these institutions have evolved significantly over the past 20 years. In relation to NACI, however, there are still systemic and organisational challenges as well as constraints that have not been satisfactorily addressed since NACI's establishment in 1997. Nevertheless, the advisory role that NACI has played over this period has been appreciated by a number of Ministers of Science and Technology and by the Department of Science and Technology (DST). Indeed, both the current and the former Ministers expressed their appreciation for the work that NACI has done and is doing. The enhanced role for NACI envisaged in the 2018 draft White Paper on Science, Technology and Innovation points to an expression of confidence in NACI's ability to fulfil the role that may be assigned to it. However, in order to be successful in the envisaged future dispensation, the ongoing systemic and organisational problems relating to NACI will need to be speedily and substantively addressed.

The current review is being conducted in a period where there is a measure of uncertainty about the future directions and priorities of key policy frameworks and legislative arrangements within the STI environment in South Africa. The new White Paper on Science, Technology and Innovation, intended to provide for future policy directions building on developments since the first White Paper of 1996, is still under discussion in draft form. Planning for a second national Foresight Exercise as well as the development of a new Decadal Plan for STI is still in process. The Review Panel had to take into account the possibility that some of its recommendations (if located solely within NACI's current policy and legislative mandate) might be rendered of little value if the STI policy landscape underwent structural re-alignment, which in turn might lead to changes in NACI's mandate, location and functions. Hence the Panel's decision to offer some of its recommendations in the form of possible future scenarios.

This Review Report reflects the consensual view of the Panel of NACI's mandate, performance and future trajectory. This view is based on a reading of selected available documentation, face-to-face, Skype and telephonic interviews conducted with a range of role-players, and several panel discussions. The Panel met in Pretoria from 15 to 18 May 2018 and subsequently conducted Skype discussions on 12 and 26 June 2018 and again on 23 July 2018 in order to reach consensus on the content of the report. A summary of the findings and recommendations of the NACI Review Panel is set out below under a set of headings that follow broadly the Terms of Reference<sup>1</sup> for the Review.

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<sup>1</sup> Terms of Reference for the Review of the National Advisory Council on Innovation April 2018 see [Appendix 1](#)

## 1.2 Extent to which recommendations from previous Review in 2008 have been addressed

The Review Panel noted that a number of recurring concerns have been raised (without satisfactory resolution) across the two-decade long period during which NACI has operated. The issues of concern were flagged, first in the 2002 Review Report, reiterated in the 2008 Review Report, and observed by the 2018 Review Panel, as posing continuing challenges for NACI's effectiveness and impact. These include:

- (a) The structural location of NACI in DST and its implications for the autonomy of NACI as well as its ability to reach Cabinet/other Ministers with innovation advice;
- (b) The need for NACI to operate with a broader definition of innovation and widen its Council composition and stakeholders to include business and civil society; and
- (c) The necessity to have a well-resourced Secretariat and staff with the requisite levels of seniority and capacity.

These areas of concern are addressed by the 2018 Review Panel in the form of recommendations for change under different sub-headings below.

In connection with the 2008 Review, the Panel noted that the NACI Council Self-Evaluation Report, which was produced in April 2018 as an input into the 2018 Review, did not include a discussion of the 2008 recommendations or the steps taken by NACI to address them. Two major recommendations from 2008 include **firstly the issue of transparency** – the proposal that NACI research reports should be published reasonably soon after completion. The Panel noted that in recent years NACI had made regular requests to the Minister (whenever Advice Letters were sent) for permission to publish the reports. In spite of this, the Panel found that very few of these research reports were made available in the public domain in the period under review.

To date only three of the 41 NACI Advice Letters produced by NACI during the review period have been published on the NACI website ([see Table 1 in section 4.3 Outcomes and Impact](#)). The questions of transparency and visibility remain a problem for NACI ([see Appendix 3](#)).

A **second** major recommendation from the 2008 review is titled **Reporting Relationships**. This covers a number of proposals relating to:

- (a) A new structural arrangement for NACI to report to a Ministers' Council on Innovation;
- (b) A reduction in the number of the NACI Council members and the greater inclusion of business leaders;
- (c) A broader definition of innovation; and
- (d) Administrative arrangements to ensure NACI's autonomy.

Some of the issues flagged in the two former reviews have been addressed but the majority of them have not. The recommendation from the 2002 review to amend the National Advisory Council on Innovation Act (No 55 of 1997)<sup>2</sup> to ensure that the Director General (DG) of DST is not the Chief Executive Officer (CEO) of NACI had not been addressed by the time of the 2008 review. However, this change was made in 2011 through an amendment to the NACI Act No 55 of 1997. The structural and reporting arrangements viewed by the 2008 Panel as areas of concern have remained largely unchanged and form the basis of some of the recommendations of the 2018 Review Panel. The Panel is aware that some of the systemic and structural problems identified in successive reviews cannot be

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<sup>2</sup> NACI Act No 55 of 1997 <https://www.gov.za/documents/national-advisory-council-innovation-act>

addressed by NACI alone but by government-led policy and legislative changes to the STI landscape. In this regard, the proposals on the role of NACI in the draft White Paper on STI (if they do become the basis of changes in policy and legislation) may very well address to a considerable extent the structural problems that have persistently constrained NACI's mandate and performance.

### 1.3 Retrospective view of NACI's mandate and performance

#### 1.3.1 Legislative mandate

The NACI Act No 55 of 1997 mandates NACI to advise the Minister of Science and Technology and through the Minister, the Ministers' Committee and the Cabinet on the role and contribution of STI in achieving national objectives. These objectives include 'improving the quality of life of all South Africans, developing human resources for Science and Technology, building the economy and strengthening the country's competitiveness in the international sphere.'

The national objectives indicated above span the policy concerns of Cabinet as a whole as well as the work and jurisdictions of different government departments. The Panel found that NACI's advice remains primarily associated with the priorities and jurisdictions of the DST and that it did not appear to have a Cabinet reach. In a few instances where the advice had a bearing on the work of other government departments, Advice Letters sent by NACI to the Minister of Science and Technology were referred by the Minister or by DST officials to the relevant government department.

NACI produced 41 Advice Letters during the review period; one of these 41 Advice Letters is still outstanding. Of the 41, eight were requested by the Minister of Science and Technology. Thirty two of the Advice Letters were proactively initiated by NACI and one was produced by NACI based on a commissioned study. The remaining Advice Letters included a submission where NACI was advised by the Department not to proceed and another where the submission was a response to the NRF's invitation to comment on its document on the positioning of the National Research Facilities, combined with a request by the Minister on the management of the National Research Facilities.<sup>3</sup>

In terms of the fate of the advice produced, out of the 41 Advice Letters produced, NACI has received a formal response from either the Minister of Science and Technology or the relevant DST Programme in fourteen instances. In five instances, the DST has written to or approached other relevant government departments to solicit their views on the Advice Letter(s) and/or take the issue(s) further.<sup>4</sup>

The Review Panel did not find evidence to indicate that these or other instances of NACI advice had been taken up in a crosscutting way within the STI system by other Ministers in government or by Cabinet as a whole.

***Recommendation 1: The Panel recommends the establishment of formal systems and procedures within DST to facilitate NACI's cross-Ministerial mandate and function and enable NACI to have a wider national reach for its advice on innovation.***

The Panel also looked at the extent to which the Minister of Science and Technology was, in fact, utilising NACI's advisory mandate to support DST's stewardship of the NSI, whether through regular commissioning of advice on innovation or through the existence of a formal system to respond to or process the advice proffered by NACI. An analysis of the advice activity between 2009 and 2017 indicates that of the 41 Advice Letters produced by NACI, only 8 were initiated by the Minister and the rest by the NACI Council. In terms of what happened to the advice once it had been received, the Panel

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<sup>3</sup> Appendix 3: NACI Advice Letters

<sup>4</sup> Appendix 3: NACI Advice Letters

found that the Minister usually referred the advice to the DG or to relevant officials or to her advisers. In five instances, the advice was shared with other government departments. Beyond this, it was not possible to determine the influence of the advice on STI policy formulation within DST. The Panel also found that feedback to NACI on the advice provided occurred in 14 instances and that there was no formal feedback mechanism that was used in a consistent way to indicate to NACI what had become of the advice that had been submitted to the Minister.

**Recommendation 2:** *The Panel recommends that a formal feedback mechanism be established within DST in order for government responsiveness to innovation advice to be strengthened and for NACI to be able to determine the value and impact of its advisory mandate within the NSI.*

The NACI Act No 55 Of 1997 stipulates 15 functions to be carried out by NACI. These functions encapsulate diverse areas of advice in a vast agenda of challenging issues across different sectors of the NSI. In addition, there is the possibility of Monitoring and Evaluation (M&E) of the performance of the NSI and Foresight Studies being added to the responsibilities of NACI. The current Council and Secretariat are unable to address all these functions effectively due to available levels of capacity and resourcing. In the view of the Panel there is also possible overlap and duplication in the advisory functions of NACI and those allocated to other science, engineering and technology institutions (SETIs), for example, the National Research Foundation (NRF) in respect of national facilities. The focus on a concise set of strategic objectives as indicated in 1.3.4 below is welcomed and should be mandated by a revision of the Act.

**Recommendation 3:** *The Panel recommends a review of the NACI Act and the mandated functions set out in the Act with a view to enhancing NACI's ability to provide a more focused and effective approach to innovation advice.*

### 1.3.2 Structural location

Concerns about the autonomy of NACI as an advisory body as a result of its location within and relationship with the DST were highlighted in the 2008 Review Report. The 2018 Review Panel found that perceptions about the lack of autonomy of NACI because of its structural location and reporting relationships have not changed, despite the fact that the Director General of DST is longer the CEO of NACI. The physical displacement of the Secretariat from the DST building to its own premises has done little to strengthen a sense of autonomy or create a strong working relationship with other role-players in the NSI. The Panel is of the view that the statutory position of NACI bears investigation. A statutory arrangement where NACI as an advisory body is not embedded within a single line department (as proposed, for example, in the DST's draft White Paper) will help to address the concerns about autonomy and facilitate a greater Cabinet-wide reach for the advice on innovation produced by NACI. However, if NACI remains within the DST under the current arrangement, additional steps need to be taken to strengthen the autonomy of NACI.

**Recommendation 4:** *The Panel recommends that NACI be constituted as a juristic person by the DST with the Council being responsible for the appointment of the members of the Secretariat and the CEO as well as for the budget.*

### 1.3.3 NACI's conception of innovation

The 2008 external review observed the need for NACI to develop a definition of innovation that is broader than science and technology and research and development driven. In the intervening period and up to the present time, the 2018 Review Panel found that there has been a shift in the NACI narrative to a broader conception of innovation which goes beyond technological innovation, one that, for example, includes innovation in the services sector and in governance. This shift is signalled in NACI's latest strategic plan (2016-2021). In its response to the draft White Paper on STI, NACI has

also urged a consistent use of a broad notion of innovation and the need to connect innovation to the basic needs of the country. NACI on its own initiative also provided advice on social innovation (2012). The Panel is of the view that NACI has yet to convert these signalled changes in its understanding of innovation into a systematic and consistent approach that underpins its advisory function and translate this approach into new strategies for identifying and producing advice aligned to a broader conception of innovation.

**Recommendation 5:** *The Panel recommends that NACI take concrete steps to translate its stated commitment to a broader notion of innovation into appropriate strategies, processes and partnerships in order for innovation advice to serve national priorities more comprehensively and effectively.*

#### 1.3.4 Strategic objectives

NACI indicates that its future operations are going to be directed by the following strategic outcome oriented goals:

**Strategic goal 1:** To facilitate agenda setting for prioritisation of science, technology and innovation (STI) in order to achieve coordination and stimulate the NSI.

**Strategic goal 2:** To advise on conducive framework conditions for STI in order to contribute to economic growth.

**Strategic goal 3:** To monitor and evaluate the contribution of STI to South Africa's economic growth and competitiveness.

**Strategic goal 4:** To establish NACI as a premier institution for providing rapid response advice.

NACI outlines the impact that these strategic objectives will have within a broader policy context. The Panel supports this more focused approach to the advice that will be provided by NACI. The achievement of these strategic objectives will, nevertheless, depend on significant changes to NACI's structural position and reporting and working relationships within the STI system, its approach to innovation, and its staffing and budgetary capacities.

#### 1.3.5 Organisational governance

The NACI Act No 55 of 1997 makes provision for between 16 to 20 members of Council. There are 21 members on the current Council (2014-2018) plus the acting head of the Secretariat. More business leaders were appointed onto the current NACI Council but the Panel noted several resignations of such members before their term ended. In 2014 the then Minister sought to enhance coordination of the NSI (long recognised as a weakness) through appointing CEOs of some science councils onto the NACI Council. It appeared to the Panel that this step did not achieve the intended coordination objective since science council CEOs are primarily focused on giving effect to their own organisational priorities. This aspect of the Council composition also raised concerns about the possibility that the interests of science councils could impact on the advisory agenda in a way that constrains a more encompassing approach to innovation. The Panel is of the view that the composition of the NACI Council should reflect a range of role-players and social stakeholders in the NSI, whose contributions could stimulate and strengthen broad-based innovation in the interests of society as a whole.

**Recommendation 6:** *The Panel recommends the inclusion of members from civil society, organised labour and the business sector in the composition of the NACI Council in order to give effect to a broader approach to innovation.*

The Panel found that some members of the NACI Council were engaged in activities like the project management of research teams, the production of research to inform advice, and writing up drafts of



the advice documents. These are activities that would normally be the responsibility of the Secretariat. The Panel was concerned that this practice blurred the line between governance oversight and operational involvement, and posed a potential conflict of interest between Council members who are required to arrive at an objective decision on the advice proposals serving before them and Council members who had been closely involved in identifying advice themes and preparing the associated advice recommendations. Such a model of work could also create the perception that the advice in some instances reflected the interests and concerns of particular individuals or task groups rather than a collective concern of the Council as a whole.

**Recommendation 7:** *The Panel recommends that the NACI Council maintain a clear separation between governance oversight and operational activities and ensure that the operational work relating to the preparation of advice is left to an empowered Secretariat.*

### 1.3.6 Operational structure, management and operations, and resourcing

The current NACI Secretariat comprises a full-time staff complement of 13 personnel, all employed by the Department of Science and Technology (DST). Of the 13 positions 12 are currently filled and one position is in the process of being filled. The 13 posts include the CEO position, eight specialists (four of whom are at a senior level) and three administrative positions.

The Panel found that NACI effectively operates as a programme of the DST, an arrangement that poses challenges to the autonomy and effectiveness of NACI. The Panel noted that the NACI Secretariat is dependent on appropriate and timely support from DST infrastructure and line functions in order to carry out its own responsibilities well. The Panel is of the view that the steps taken by DST to stabilise and strengthen NACI's operational systems in response to repeated concerns about the weakness of the NACI Secretariat (which were flagged in the 2002 and 2008 Review Reports) have not been successful. In the nine-year period under review, NACI has had eight Chief Executive Officers (CEOs), some of them in office only for a few months duration. The current head of the Secretariat has been in his position since 2015 but remains in an acting capacity.

The NACI allocated budget for 2016/17 was R18.8 million, up from R 13.7 in 2009/2010. More than 50% of the budget goes towards staff salaries. The expenditure on goods and services from the annual budget was R8.2 million of which NACI expended R5.7 million resulting in an under-expenditure of R2.4 million. Accumulated savings in respect of goods and services occurred as a result of the development of national STI data and the information portal internally.<sup>5</sup>

The Panel is concerned that ongoing problems of limited staff capacity and budgetary resources will make it extremely difficult for NACI to give full and proper effect to its current mandated functions and, in addition, take on new responsibilities. The active support of the Minister and the DST will be crucial to a resolution of some of the key problems relating to NACI's resourcing, capacity and operational stability. The establishment of a periodically reviewed performance agreement between the Minister and NACI on the deliverables from NACI's strategic objectives could establish a clear performance and accountability framework for advice on innovation.

**Recommendation 8:** *The Panel recommends that, with the support of DST, NACI develop a transitional plan or roadmap that will take it from its current state towards the kind of organisation envisaged in the 2018 draft White Paper. Such a roadmap should include proposals relating to a stable and empowered staff complement, a budget that can support NACI's envisaged new mandate and a clear delineation of roles, responsibilities and accountability of the NACI Secretariat to assist the Council to play its strategic role more fully.*

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<sup>5</sup> See NACI budgets [Appendix 7](#), page 54



### 1.3.7 Impact of NACI

The Panel noted that NACI had produced 41 Advice Letters and research reports in the period between 2009 and 2017. Working under many systemic and operational challenges, it has sought to deliver as best it could on its advisory mandate. Despite its productive output, the Panel is of the view that a range of systemic and organisational factors have worked together to limit NACI's efficiency and impact within the NSI. These include, as mentioned in other sections of the Report, NACI's structural location and reporting arrangements; NACI's conception of innovation, its Council composition and choice of advice themes as well as its secretarial capacity; the use made of the advice either by the Minister of Science and Technology or other ministries, and the timeous publication/dissemination of advice-related documents. The Panel found that NACI is not very visible within business; its mandate and work is not well-known even among senior staff at higher education institutions; and it is hardly known within civil society. NACI appears to operate largely within the confines of the DST. Its impact on the NSI is thus seen to be minimal except in relation to the publication of the annual indicators, which did receive wider attention in the STI environment.

The Panel noted that, in most instances, innovation advice remained within DST rather than informing a broader discussion within Cabinet or within other relevant government departments. Given NACI's conception of innovation and the composition of the Council, the Panel considered it unlikely that the issues raised in the Advice Letters would have had much resonance in the business or civil society sectors. The lack of seniority and capacity in the NACI Secretariat also limited networking and relationship-building across different sectors of the NSI.

The Panel found that NACI's choice of advice themes, advice format and approach to identifying advice themes also played a role in constraining its impact. In the Panel's view, government receptiveness to the advice was limited by concerns (expressed by the former Minister and the DG) that the NACI research reports were interesting and well done but that the advice based on them was not sufficiently helpful to policymakers who wanted clearer action steps to be identified. In this regard NACI had changed its advice format in the last few years to include more explicit action steps for the Minister's consideration. In cases where advice had been proactively provided by NACI, the advice themes were viewed as being insufficiently aligned with DST priorities and without adequate input from the Minister as to what constituted priority issues at the time. There was also a concern that the advice was often not about issues pertaining to the STI system at large and sometimes more reflective of the interests of particular groups.

The Panel found that the absence of formal written communication and feedback from the Minister in response to most instances when NACI had provided advice also made it difficult to judge the nature and extent of NACI's influence on policy thinking and policy development in DST.

The Panel found that the issues of transparency and visibility continued to limit the impact of NACI. These issues had already been flagged as problematic in the 2008 review of NACI which urged that NACI reports be made available in the public domain. The 2018 Panel found that this recommendation has been acted upon in a very limited way since 2009. An analysis of the status of NACI documents indicates that only three of the research reports on which advice was based were published. In addition, the proceedings of six roundtable discussions (which preceded the development of advice) were put into the public domain. The Panel noted that this pattern of limited public dissemination of NACI's policy analyses on which advice was based was mainly due to NACI not receiving authorisation from the Minister/DST for the research reports to be published.

The Panel is of the view that the visibility and impact of NACI as an apex organisation providing innovation advice within the NSI needs to be strengthened considerably if NACI is to deliver effectively on its mandate. It is clear to the Panel that changes to the current statutory dispensation as well as to organisational choices and practices are required to enable NACI to make a strong and decisive contribution to the STI system. The Panel has made a number of recommendations in other sections of this report which have a bearing on the question of NACI's impact. Recommendations and observations which are pertinent here relate to the strengthening of NACI's cross-Ministerial mandate, the establishment of a formal feedback mechanism, NACI's conception of innovation, the composition of the NACI Council, and the strengthening of NACI's Secretariat. In addition, the Panel makes the following recommendations:

**Recommendation 9:** *NACI should be more proactive in seeking meetings with the Minister to facilitate regular and open communication on its advice plans and activities. This will allow for greater input from the Minister on advice themes and could enhance the receptiveness of the Ministry to advice from NACI.*

**Recommendation 10:** *NACI should strengthen and widen its consultative arrangements for getting input into its advice plans and activities from STI role-players and stakeholders, especially from the business and civil society sectors.*

**Recommendation 11:** *NACI should ensure that its research reports are made available in the public domain timeously and disseminated to key STI sectors.*

#### 1.4 Future strategic directions for NACI

The emerging vision globally of growth and development being driven by innovation in the broadest sense, provides a challenge to both policy makers and their advisors to understand this new landscape and craft a locally appropriate response that will harness these developments for the benefit of the country. This changed policy environment is sketched in the draft White Paper with its emphasis on re-booting the NSI through a renewed vision of innovation driven growth and development – central to this vision is the important systemwide role that NACI could play in providing advice that would guide the new strategies.

The Panel is of the view that NACI could and should play a significant role in providing innovation advice to the Cabinet in support of the continuing development of the NSI. As currently constituted and structurally located, NACI will continue to struggle to deliver on its mandate effectively. A new structural dispensation for NACI will be necessary. The draft White Paper of May 2018 proposes to extend the mandate, sphere of influence and functions of NACI. The extent to which the new STI landscape and NACI's role and position within it will follow the ideas proposed in the draft WP is unknown at this stage. The Panel took into consideration its findings on NACI as it currently exists as well as the directions signalled in the draft White Paper in order to identify three different scenarios for NACI's future.

The three scenarios considered by the Panel are:

**1. Revised current scenario:** NACI continues to operate under the current statutory dispensation but is given greater autonomy from DST (for example, to appoint and manage its own staff and the CEO). Procedures are put in place to extend its advice to Cabinet as a whole. The financial resources and staff capacity of the Secretariat are strengthened over time.

**2. Extended 'services' function scenario:** With a substantial revision of the NACI Act, NACI is given an extended mandate and additional resources to deliver innovation advice and services to the Cabinet.

Services that would be additional to its advisory role could include the implementation of Monitoring and Evaluation (M&E) of the performance of the NSI, Foresight Studies; stimulating and consolidating coherence and connectivity in the NSI; and contributing to the productive functioning of the NSI in general. More implementation services could be added to NACI's portfolio as required.

**3. Extended advisory function scenario:** With a substantial revision of the NACI Act, NACI provides advice to the Cabinet (cf. the inter-Ministerial Committee proposed in the draft White Paper) and to relevant actors in the STI system. This includes the R&D sector of the science councils and the universities, the business sector and civil society (cf. the occasional reference to Quadruple Helix in the draft White Paper). NACI's advisory function will include *advice* on Monitoring and Evaluation (M&E) via the publication of indicators, *advice* on Foresight Studies; *advice* on stimulating and consolidating coherence in the NSI, and the productive functioning of the NSI in general via the inter-ministerial committee.

The Panel is of the view that Scenario 1 provides too limited a role for NACI given the innovation requirements of the country. It should, preferably, be regarded as a transitional step in the direction of one of the extended scenarios. The extended 'services' function scenario provides for a NACI that has both an advisory function and aspects of an implementation function. The Panel did not favour such a scenario since it was of the view that the implementation of STI policy should reside with the relevant government departments and associated structures and not compromise the advisory function.

**Recommendation 12:** *The Panel recommends the extended advisory function scenario as the most appropriate one to support and strengthen the further development of the NSI. This is the scenario largely envisaged in the draft White Paper and it could provide for the transformation of NACI into an autonomous and focused advisory body with national impact.*

In conclusion, two previous reviews of NACI have identified serious problems of a conceptual, structural and organisational nature in the set-up and operations of NACI. These problems have weakened NACI's effectiveness and limited its impact in delivering on its mandated functions. The current review has found that many of the systemic and operational arrangements which led to the problems mentioned above have remained with little or no change. The Panel hopes that the current context of change in the STI environment driven by the development of a new White Paper will provide the opportunity to address the recurring problems in NACI identified by all three reviews, and reposition NACI to play a catalytic system-wide role in providing innovation advice for the social and economic development that South Africa so urgently needs.

## 1.5 Summary of recommendations

The following lists the 12 key recommendations of the 2018 Review Panel with an indication of who should be responsible for implementation.

**Recommendation 1:** *The Panel recommends the establishment of formal systems and procedures within DST to facilitate NACI's cross-Ministerial mandate and function and enable NACI to have a wider national reach for its advice on innovation. (Responsible: Minister and DST with support from Council)*

**Recommendation 2:** *The Panel recommends that a formal feedback mechanism be established within DST in order for government responsiveness to innovation advice to be strengthened and for NACI to be able to determine the value and impact of its advisory mandate within the NSI. (Responsible: Minister and DST).*

**Recommendation 3:** *The Panel recommends a review of the NACI Act and the mandated functions set out in the Act with a view to enhancing NACI's ability to provide a more focused and effective approach to innovation advice.* (Responsible: Minister and DST with assistance of Council).

**Recommendation 4:** *The Panel recommends that NACI be constituted as a juristic person by the DST with the Council being responsible for the appointment of the members of the Secretariat and the CEO as well as for the budget.* (Responsible: Minister, DST and Council when implementing White Paper proposals).

**Recommendation 5:** *The Panel recommends that NACI take concrete steps to translate its stated commitment to a broader notion of innovation into appropriate strategies, processes and partnerships in order for innovation advice to serve national priorities more comprehensively and effectively.* (Responsible: NACI Council).

**Recommendation 6:** *The Panel recommends the inclusion of members from civil society, organised labour and the business sector in the composition of the NACI Council in order to give effect to a broader approach to innovation.* (Responsible: Minister: when reconstituting NACI council).

**Recommendation 7:** *The Panel recommends that the NACI Council maintains a clear separation between governance oversight and operational activities and ensure that the operational work relating to the preparation of advice is left to an empowered Secretariat.* (Responsible: NACI Council).

**Recommendation 8:** *The Panel recommends that, with the support of DST, NACI develop a transitional plan or roadmap that will take it from its current state towards the kind of organisation envisaged in the 2018 draft White Paper. Such a roadmap should include proposals relating to a stable and empowered staff complement, a budget that can support NACI's envisaged new mandate and a clear delineation of roles, responsibilities and accountability of the NACI Secretariat to assist the Council to play its strategic role more fully.* (Responsible: Minister, DST and NACI Council).

**Recommendation 9:** *NACI should be more proactive in seeking meetings with the Minister to facilitate regular and open communication on its advice plans and activities. This will allow for greater input from the Minister on advice themes and could enhance the receptiveness of the Ministry to advice from NACI.* (Responsible: NACI Council).

**Recommendation 10:** *NACI should strengthen and widen its consultative arrangements for getting input into its advice plans and activities from STI role-players and stakeholders, especially from the business and civil society sectors.* (Responsible: NACI Council).

**Recommendation 11:** *NACI should ensure that its research reports are made available in the public domain timeously and disseminated to key STI sectors.* (Responsible: Minister, DST and NACI Council).

**Recommendation 12:** *The Panel recommends the extended advisory function scenario as the most appropriate one to support and strengthen the further development of the NSI. This is the scenario largely envisaged in the draft White Paper and it could provide for the transformation of NACI into an autonomous and focused advisory body with national impact.* (Responsible: Minister, DST and NACI Council).

## 2. Introduction

The National Advisory Council on Innovation (NACI) is a statutory body established in terms of the National Advisory Council on Innovation Act, 1997 (Act no 55 of 1997). NACI advises the Minister of Science and Technology and, through the Minister, Cabinet, on various matters pertaining to science, technology and innovation (STI) in South Africa. The Council places great emphasis on providing evidence-based advice that is valuable and relevant. NACI utilises available research and policy expertise in round-table discussions to access and mobilise inputs on themes relevant to the national system of innovation (NSI). The advice, which is confidential, is developed on the basis of such inputs as well as commissioned research reports.

Since its inception, NACI has been subject to two external evaluations or institutional reviews, one in 2002 and the other in 2008. Given two key developments in its current environment, the prospective appointment of a new council and the potential redefinition of its role as envisaged in the draft White Paper on STI, NACI decided that it was necessary to conduct a review of its work covering the period between 2009 and 2017.<sup>6</sup>

The current NACI Council (2014-2018) approved the latest institutional review process after discussions with the Minister. The Council with the concurrence of the Minister constituted a panel of local and international experts to conduct an external assessment of the work of NACI. The Council also initiated an internal assessment process as reflected in the self-evaluation report.<sup>7</sup> The internal assessment involved the use of multiple data collection methods – survey questionnaires, documentation and internal discussions at Council and at Executive Committee (ExCo) level. The findings from the internal assessment process served as an input into the external review process. NACI intended that the findings and recommendations of the external assessment and its recommendations could serve as guidance for the incoming Council, which is scheduled to take office in August 2018.

### 2.1 Purpose and scope of the Institutional Review

The Minister of Science and Technology has a legal responsibility for the governance and resourcing of national public entities including NACI. Institutional Reviews are conducted as an oversight mechanism to evaluate whether organisations are meeting their objectives. Such reviews are not a statutory requirement. Their aim is to facilitate an independent assessment of an organisation's strengths and weaknesses and allow for reflections on the operations of an organisation to determine if organisational structures, policies and programmes are fit for purpose and also to benchmark with similar organisations.

The purpose of the 2018 NACI Institutional Review is to provide a retrospective view on the performance of NACI in terms of its legislative mandate and strategic objectives. It is aimed at providing critical views on possible gaps not addressed by NACI in terms of the NACI Act (Number 55 of 1997 as amended in 2011<sup>8</sup>) and to assess the extent to which the recommendations of the previous review in 2008 have been addressed. (See [Appendix 1](#) for the full Terms of Reference)

The 2018 NACI Institutional Review focused on assessing the effectiveness of the organisational governance, operational structure, management and resourcing of NACI. The Review Panel also examined the strategic choices made by NACI, its activities and relationships, and the impact of its work. On the basis of its review, the Panel offers recommendations on the future strategic direction

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<sup>6</sup> Terms of Reference for the Review of the National Advisory Council on Innovation , April 2018 see [Appendix 1](#)

<sup>7</sup> NACI Council: self-evaluation report, April 2018

<sup>8</sup> <https://www.gov.za/documents/national-advisory-council-innovation-act>

and operational execution of the NACI mandate. In both its analyses and recommendations, the Panel sought to take account of the prevailing local and international context as well as emerging trends in STI systems.

## 2.2 Review methodology

The Review Panel conducted the review on the basis of an analysis of relevant documentation pertaining to NACI's work, interviews with internal and external role-players and an analysis of a self-evaluation report prepared by NACI. The Panel met in Pretoria, South Africa over a period of four days from 15 to 18 May 2018. The Panel conducted semi-structured interviews with 21 key players individually and also had extended discussions with the Council of NACI as a group and the ExCo as a group. The full list of those consulted and their designations is available below in [Appendix 2](#).

The Panel interviewed individuals from government, higher education, the private sector and various other role players in the South African science and innovation system. During its deliberations the Panel identified a small group of additional individuals to be consulted. Where time did not permit, these individuals submitted their responses to questions via email. An additional four role-players were interviewed in this manner. One of the Council members who was not able to stay for the discussion with the Review Panel submitted inputs via email as well. In total, some 26 individuals were consulted.

The Review Panel was also provided with a recent self-evaluation report based on a survey of the views of members from the current NACI Council, which is nearing the end of its term of office.

## 2.3 Limitations of the review

The review was undertaken within a very constrained timescale. The original schedule was affected by a change of Ministers late in February 2018 and the need to get the approval of the newly appointed Minister for the Terms of Reference of the review and related matters. It was also necessary to complete the review as close to the end of June 2018 as possible so that the current Council could review the recommendations and pass on their views to the incoming Council.

Due to the constrained timelines, physical meeting time was compromised, and the Panel had to resort to the use of meetings via Skype.

The Panel would have liked to have spoken to more representatives of the STI community and especially more members of civil society and the business and labour sectors. Attempts were made to contact some of the people identified by the Panel but unfortunately (although willing to participate), they were unable to do so given the short notice.

The Panel was aware as well that its recommendations to improve the performance of NACI will be subject to decisions being made in other arenas including DST-led discussion of the draft White Paper and in Cabinet.

## 2.4 Approach taken by the Panel as a result of the current STI context

In its planning of the review, the Panel had to take account of the fact that the current review is being conducted in a period where there is a measure of uncertainty about the future directions and priorities of key policy frameworks and legislative arrangements within the Science, Technology and Innovation (STI) environment in South Africa. The new White Paper on Science, Technology and Innovation, intended to provide for future policy directions building on developments since the first White Paper of 1996, is still under discussion in draft form. Planning for a second national Foresight Exercise as well as the development of a new Decadal Plan for STI is still in process.



It was clear to the Panel that there was more at stake in this particular review than would be the case in a routine Institutional Review. The draft White Paper of May 2018 proposes to extend the mandate and tasks of NACI. While the Review Panel's terms of reference did not require engagement with the draft White Paper, it was felt that the Panel's recommendations should have a forward looking component based on an evaluation of NACI's present and possible future mandate.

The Review Panel had to take into account the possibility that some of its recommendations (if located solely within NACI's current policy and legislative mandate,) might be rendered of little value if the STI policy landscape underwent structural re-alignment, which in turn might lead to changes in NACI's mandate, location and functions. The Panel decided, therefore, to offer some of its recommendations in the form of three future scenarios. These are:

**1. Revised current scenario:** NACI continues to operate under the current statutory dispensation but is given greater autonomy from DST (to appoint and manage its own staff and the CEO). Procedures are put in place to extend its advice to Cabinet as a whole. The financial resources and staff capacity of the Secretariat is strengthened over time.

**2. Extended 'services' function scenario:** With a substantial revision of the NACI Act, NACI is given an extended mandate and additional resources to deliver innovation advice and services to the Cabinet. Services that would be additional to its advisory role could include the implementation of Monitoring and Evaluation (M&E) of the performance of the NSI, Foresight Studies; stimulating and consolidating coherence and connectivity in the NSI; and contributing to the productive functioning of the NSI in general. More implementation services could be added to NACI's portfolio as required (e.g. CeSTII).

**3. Extended advisory function scenario:** With a substantial revision of the NACI Act, NACI provides advice to the Cabinet (cf. the inter-Ministerial Committee proposed in the draft White Paper) and to relevant actors in the STI system. This includes the R&D sector of the science councils and the universities, the business sector and civil society (cf. the occasional reference to Quadruple Helix in the draft White Paper). NACI's advisory function will include *advice* on Monitoring and Evaluation (M&E) via the publication of indicators, *advice* on Foresight Studies; *advice* on stimulating and consolidating coherence in the NSI, and the productive functioning of the NSI in general via the inter-ministerial committee.

The Panel has identified two scenarios for the extended mandate outlined in the draft White Paper, because the Panel is of the view that the provision of services does not mix well with the advisory function and that the combination of advice and services may be detrimental to an effective advisory function. The scenario 2 is an agency task (like the Institute of Science and Technology Evaluation and Planning or KISTEP in Korea and to some extent the National Institute of Science and Technology Policy or NISTEP in Japan. Scenario 3 outlines the functions of a national advisory council. An advisory council will need data and evidence to be able to offer good advice but key to its function is a sound diagnosis of the situation with its social and political implications taken into account. See [Appendix 9](#) for a comparative analysis of the way in which various countries have organised their advisory structures.

The Panel distinguished three functions of NACI, following the lead of the draft White Paper:

- (a) Monitoring and Evaluation as a responsibility of NACI. This would be through the production of analytical reports and recommendations analogous to the currently produced annual indicators.
- (b) Policy advice and support.
- (c) Advice and analytical reports on NSI coordination (without the responsibility for implementing coordination strategies).



These three functions would be partially undertaken in Scenario 1, would be a component of what is undertaken in Scenario 2 (but could be compromised by implementation activities) and would be the core of Scenario 3 activities with a clearly focused mandate.

## 2.5 Review Panel members

The Expert Review Panel consisted of seven members including four international experts. The Panel was tasked with reflecting on NACI's achievements between the years 2009 and 2017 and making recommendations for the future development of the organisation.

### Panel of experts:

- **Prof Robin Crewe**, Senior Research Fellow, Centre for the Advancement of Scholarship, University of Pretoria, South Africa (Chairperson)
- **Dr Sibongile Gumbi**, Independent Consultant; former Group Executive Technology Innovation Agency, South Africa
- **Dr Yuko Harayama**, former Executive Member of the Council for Science, Technology and Innovation, Cabinet Office, Japan
- **Mr Gernot Hutschenreiter**, Head, Country Innovation Policy Reviews, Science and Technology Policy Division, Directorate for Science, Technology and Innovation, Organisation for Economic Co-operation and Development, Paris, France
- **Prof Thiago Renault**, Department of Administrative and Accounting Sciences of the Federal Rural University of Rio de Janeiro, Brazil
- **Prof Arie Rip**, Professor of Philosophy of Science and Technology in the School of Management and Governance, University of Twente, The Netherlands
- **Prof Mala Singh**, National Research Foundation Board Member, former Council for Higher Education Executive Director, South Africa

### 3. Extent to which recommendations from the previous review in 2008 have been addressed

The [Terms of Reference](#) for the 2018 Review included a request to the Panel to assess the extent to which the recommendations of the previous review in 2008 have been addressed.

The Review Panel noted that a number of recurring concerns have been raised (without satisfactory resolution) across the two-decade long period during which NACI has operated. The issues of concern were flagged, first in the 2002 Review Report, reiterated in the 2008 Review Report, and observed by the 2018 Review Panel as posing continuing challenges for NACI's effectiveness and impact. These include:

- (d) The structural location of NACI in DST and its implications for the autonomy of NACI as well as its ability to reach Cabinet/other Ministers with innovation advice;
- (e) The need for NACI to operate with a broader definition of innovation and widen its Council composition and stakeholders to include business and civil society; and
- (f) The necessity to have a well-resourced Secretariat and staff with the requisite levels of seniority and capacity.

These areas of concern are addressed by the 2018 Review Panel in the form of recommendations for change under different sub-headings below.

In connection with the 2008 Review, the Panel noted that the NACI Council Self-Evaluation Report, which was produced in April 2018 as an input into the 2018 Review, did not include a discussion of the 2008 recommendations or the steps taken by NACI to address them. Two major recommendations from 2008 include **firstly the issue of transparency** – the proposal that NACI research reports should be published reasonably soon after completion. The Panel noted that in recent years NACI had made regular requests to the Minister (whenever Advice Letters were sent) for permission to publish the reports. In spite of this, the Panel found that very few research reports were made available in the public domain in the period under review. The problem of transparency and visibility remains a problem for NACI (see [Appendix 3](#)).

A **second** major recommendation from the 2008 review is titled **Reporting Relationships**. This covers a number of proposals relating to:

- (e) A new structural arrangement for NACI to report to a Ministers' Council on Innovation;
- (f) A reduction in number of the NACI Council members and the greater inclusion of business leaders;
- (g) A broader definition of innovation; and
- (h) Administrative arrangements to ensure NACI's autonomy.

Some of the issues flagged in the two former reviews have been addressed but the majority of them have not. The recommendation from the 2002 review to amend the National Advisory Council on Innovation Act, 1997 (Act no 55 of 1997)<sup>9</sup> to ensure that the Director General (DG) of DST is not also the Chief Executive Officer (CEO) of NACI had not been addressed by the time of the 2008 review. However, this change was made in 2011 through an amendment of the NACI Act No 55 of 1997. The structural and reporting arrangements viewed by the 2008 Panel as areas of concern have remained unchanged and form the basis of some of the recommendations of the 2018 Review Panel. The Panel is aware that some of the systemic and structural problems identified in successive reviews cannot be addressed by NACI alone but by government-led policy and legislative changes to the STI landscape.

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<sup>9</sup> NACI Act No 55 of 1997 <https://www.gov.za/documents/national-advisory-council-innovation-act>

In this regard, the proposals on the role of NACI in the draft White Paper on STI (if they do become the basis of changes in policy and legislation) may very well address to a considerable extent the structural problems that have persistently constrained NACI's mandate and performance. Whatever the structural scenario is for NACI in the future, these issues have to be addressed vigorously and systematically for NACI to be able to play a crucial role in the advancement of broad-based innovation in the NSI.

## 4 Detailed observations

### 4.1 Mandate, aims, objectives

#### Observations

**NACI advisory function and limited Cabinet reach:** The mandate refers to the role of NACI in providing advice on STI to the Minister (DST) and to the Cabinet (through the Minister) in order to address national problems like improving the quality of life, building the economy, etc. There has been repeated criticism that the advice is perceived to be narrowly associated with the concerns and priorities of DST and that it does not have a Cabinet reach. This is a matter of continuing concern.

A few of the Advice Letters were referred by the Minister/officials in the DST to other relevant government departments, for example, advice on food security or skills sustainability. There is no evidence to indicate that these or other instances of NACI advice were taken up in a crosscutting way by other Ministers or Cabinet as a whole.

NACI produced 41 Advice Letters during the review period; one Advice Letter is still outstanding. Of these eight were requested by the Minister of Science and Technology. Thirty two of the Advice Letters were proactively initiated by NACI and one was produced by NACI based on a commissioned study. The remaining Advice Letters included one submission where NACI was advised by the Department not to proceed and another where the submission was a response to the NRF's invitation to comment on its document on the positioning of the National Research Facilities, combined with a request by the Minister on the management of the National Research Facilities.<sup>10</sup>

In terms of the fate of the advice produced, out of the 41 Advice Letters produced, NACI has received a formal response from either the Minister of Science and Technology or the relevant DST Programme in 14 instances. In five instances, the DST has written to or approached other relevant government departments to solicit their views on the Advice Letter(s) and/or take the issue(s) further.

NACI could not provide evidence to indicate that these or other instances of NACI advice were taken up in a crosscutting way within the STI system by other Ministers in government or by Cabinet as a whole.

**Uptake of advice:** The Panel looked at the extent to which the Minister of Science and Technology was, in fact, making regular and significant use of an organisation like NACI that had been established to provide advice on innovation. A review of the advisory activity between 2009 and 2017 indicates that the large majority of the reports offering advice were proactively initiated by NACI. Requests from the Minister for advice (there were two Ministers spanning three terms in that period) appear to have been sporadic. There are successive years between 2010 and 2013 where no Ministerial requests at all were made to NACI although NACI continued to proactively provide advice. (Details in [Appendix 3](#).)

The Review Panel expressed concern that the cross-ministerial function is not being fulfilled. There is no formal channel to share innovation advice with other Ministries and there is no direct line to the Cabinet in place.

**Recommendation 1:** *The Panel recommends the establishment of formal systems and procedures within DST to facilitate NACI's cross-Ministerial mandate and function and enable NACI to have a wider national reach for its advice on innovation.*

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<sup>10</sup> Appendix 3: NACI Advice Letters

**Recommendation 2:** *The Panel recommends that a formal feedback mechanism be established in order for government responsiveness to innovation advice to be strengthened and the value and impact of NACI’s advisory mandate to be more clearly established within the NSI.*

The formal feedback mechanism should be in the form of a mandated response from the Minister to a piece of advice within a specified time.

**NACI’s conception of innovation:** The 2008 external review observed the need for NACI to go beyond a technological conception of innovation. In the intervening period and up to the present time, it seems that there has been some shift in the narrative to a broader conception of innovation, one that includes societal sectors beyond technological innovation, for example, the importance of innovation in the services sector.

Such a broader conception of innovation, one that includes non-R&D-based and non-technological forms of innovation such as innovation in organisation, marketing and business models that play an important role in transforming entire sectors of contemporary economies. Innovation in the service sector, public sector innovation and systemic transitions that are required to tackle societal challenges all require important contributions from non-technological innovation and from new actors and stakeholders, especially but not exclusively on the demand side for innovation, for example, the importance of innovation in the services sector. Similar statements can be made on profound economic and societal transformation that are currently being brought about by digitisation.

This shift is hinted at in NACI’s strategic documents:

*“Innovation has always been a foundation for economic growth. From the invention of the wheel to the Industrial Revolution, the invention of medicines to air transport and the Internet, innovation leads to change and progress. In today’s world, beset by financial, social and environmental challenges, and looking for new, stronger, more inclusive and sustainable ways forward, innovation is more important than ever, and policies to foster it, leading to the creation and diffusion of new products, processes and methods, are vital.*

*Innovation can be measured in several aspects of a country’s growth. First, there is technological progress embodied in tangible, physical capital, such as better machinery, smarter equipment or greener buildings. Second, there is intangible, knowledge-based, capital, such as software, data, research and development (R&D), design, intellectual property, and firm-specific skills.*

*Third, there is the smarter, more efficient use of labour and capital to generate so-called multifactor productivity growth (also referred to as total factor productivity). Fourth, there is the role that innovation plays in strengthening the dynamics of an economy, with new innovative firms entering the market, replacing other slower, less innovative ones in a process known as creative destruction. Together, these four dimensions account for as much as half of GDP growth.*

*Innovation is also about what humankind needs. It is critical for addressing profound social and global challenges (such as climate change, health, food security, poverty and access to clean water) in an affordable and timely manner. At the same time, innovation can contribute to inequality, which is why it needs to be accompanied by appropriate labour and social policies (OECD, 2015).”<sup>11</sup>*

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<sup>11</sup> NACI Strategic Plan 2016-2021

Signs of such a shift did emerge during interviews conducted by the 2018 Institutional Review Panel with some of the NACI Board members. Other interviewees who supported the idea of a broader notion of innovation were, however, concerned that this conceptual shift has not been sufficiently incorporated and translated into NACI's advice and strategies. NACI's practice has still to catch up with the narrative shift in how innovation is being framed.

Some interviewees pushed the concern with NACI's current approach to innovation further to argue that such an approach reflected the vantage point of the supply side of the innovation equation, for example, those who were driven by an interest in improving systemic enablements and increasing financial allocations to R&D organisations. A proper broadening of the notion of innovation required a responsiveness to the demand side of innovation, as articulated, for example, in the views and interests of organised labour, civil society formations and other organisations working close to the ground in respect of civic and societal challenges facing South African society. NACI requires a more visible and explicit alignment between its broader notion of innovation and its choice of themes and processes for generating advice.

Such a substantive shift in the narrative and practice of innovation may also help to clear the perceived overlap between the mandate to provide advice directly to government of NACI and the advisory role of the Academy of Science of South Africa (ASSAf). NACI's role will be one of advice on innovation that addresses societal problems and challenges (as the NACI Act prescribes) rather than advice that emanates from broad multidisciplinary approaches, which is the domain of ASSAf.

Important as they are, we would warn against restricting NACI's role to societal challenges only. This would leave a wide unattended gap if taken literally as there are very important systemic issues to be dealt with in the South African NSI which are not immediately related to societal challenges. Also, we would imagine that ASSAf has important things to say on societal challenges (energy transitions; demographic change etc.). The Panel was of the view that the role of an Academy and that of a ministerial advisory body such as NACI are quite distinct although they should be encouraged to collaborate in their respective and complementary domains.

The Panel viewed this discussion about the advisory roles of entities within the NSI as a symptom of a general lack of clarity regarding the roles of the different institutions that does not appear to have been sufficiently addressed by the Ministerial Review Committee chaired by Prof Loyiso Nongxa ([see p 60, Appendix 8](#)). The governance of innovation would be more efficient if the role of different institutions were more clearly defined especially in relation to the proposed Inter-ministerial committee and NACI's role in relation to this.

***Recommendation 5: The Panel recommends that NACI take concrete steps to translate its stated commitment to a broader notion of innovation into appropriate strategies, processes and partnerships in order for innovation advice to serve national priorities more comprehensively and effectively.***

The Panel would like to see market innovation, social innovation and technology development becoming more prominent in NACI's work. There is potential for massive development in the services sector. These aims could be achieved by designing policies that attract stakeholders in these sectors. By broadening its view of innovation NACI will attract more people and increase its impact.

The shift that is outlined above and that emerged in the discussion with the Council, has not yet been demonstrated in the reports that have already been provided. These are very technologically orientated in a narrower sense of innovation. The HSRC has started working more closely with NACI in the last 18 months in order to make the importance of social innovation more prominent in their deliberations as indicate by Prof Crain Soudien CEO of the HSRC.

There are tax incentives for companies and individuals engaging in R&D in South Africa and the DTI has programmes to connect researchers with the private sector, but the incentives do not seem to have achieved the anticipated impact. The draft White Paper proposes that these initiatives need to be revisited and perhaps revitalised, but their impact on economic development needs to be reassessed.

In relation to their future co-ordination activities, NACI could propose ways in which the private sector can identify the opportunities and make use of them. In addition, NACI should engage with the Technology Innovation Agency (TIA) and the Industrial Development Corporation (IDC) to ensure a co-ordinated approach to the challenge of investing in innovation.

## 4.2 Outputs – products, activities, priorities

### Observations

The forms of advice produced by NACI have included proactive advice, solicited advice and rapid advisories. The details of the NACI Advice Letters produced between 2009 and 2018 are listed in [Appendix 3 below](#).

**Quality of advice:** In order to assess the perceived quality of the advice that had been provided, the Panel questioned the interviewees about their views of the advice and its impact.

Former Minister Ms Naledi Pandor for example was asked whether the advice provided by NACI informed policies and processes that were underway and the extent to which she felt the advice had impact. Her response was that she and the department had not responded to all the advice provided, but that she had referred the advice to the DG and the appropriate DST programme for their views and response. She indicated that a good reference process had not been developed for her to indicate her objectives within the NSI and how she wanted advice on these matters. She suggested that the process of identifying subjects for advice needs to be strengthened. She indicated that the reports that she received had been excellent pieces of work but that the extraction of the actual advice was often difficult. She indicated that this difficulty had been discussed with the Chair of NACI.

In addition to objective summaries of relevant research, NACI advice needs to suggest possible policy options, or go even further and argue for particular courses of action. NACI needs to focus on packaging the advice in such a way that policy makers can clearly see the policy options that are being proposed, clearly articulating why a particular policy option is best and providing particular actions that are proposed by the advice.

We asked whether NACI was in a position to provide a suitably critical environment in which to provide advice. A respondent suggested that while financial control remained vested in the department, its ability to be bold and decisive in its environment was constrained.

The STI indicators as a tool for providing critical advice are regarded as a flagship production of NACI and have the virtue for being made public. The indicators enable the Council to provide a systemic view of what is being done (including its efficacy), what needs to be done, and recommend steps to be undertaken to improve the STI policy performance.

### Comments:

The Review Panel was struck by the fact that while advice is being produced, there seems to be a lack of a governance structure within the ministry and the department on implementation. This problem is not unique to South Africa ([see Recommendation 2](#)).



## 4.3 Outcomes and impact

### Observations

**Scope and reach of the advice:** The Panel discussed the performance of the advice function – is NACI doing the right things and how effectively is NACI discharging its advice mandate? Advice in most instances remained within DST rather than informing a broader discussion within Cabinet or with other relevant government departments. In interviews with the former Minister and the DG, it became clear that the Minister referred the advice received to the DG or to relevant officials or to her advisers. In a few instances, the advice was shared with other government departments. Beyond this, it was not possible to determine the influence of the advice or whether any collective action flowed from the advice that had been shared. More generally, there was a strong perception among many of the interviewees that NACI had little visibility within the NSI – even senior administrators within higher education institutions did not know about NACI’s mandate or its activities. NACI is seen to operate within the confines of DST with little external impact. Its impact on the NSI is thus seen to be minimal. There was a strong perception that NACI could do more to demonstrate that it was fulfilling its mandate.

**Recommendation 11:** *NACI should ensure that its research reports are made available in the public domain timeously and disseminated to key STI sectors.*

**Impact of advice:** Both the former Minister and the DG indicated that they found the NACI research reports to be very interesting and well done but that they were not sufficiently helpful to enable policymakers to think through what steps needed to be taken in order to give effect to the advice. In the cases where advice had been proactively provided by NACI, the themes were not necessarily aligned with DST priorities at the time. There was also a concern that the advice was often not about issues pertaining to the system at large and sometimes narrowly associated with the interests of particular groups. The former Minister also felt that she had not made sufficient input into NACI’s choice of advice areas.

In most instances NACI did not receive any communication regarding the advice that it had provided. There were anecdotal examples of the former Minister sometimes using the advice and associated research report in a public speech that she made or of a spoken communication with the Chairperson but there was no formal written response about the advice received and whether and how it had been acted upon if at all. All interviewees including the former Minister and DG agreed that a feedback mechanism, a formal system of written response to the advice would be appropriate to put into place.

**Recommendation 9:** *NACI should be more proactive in seeking meetings with the Minister to facilitate regular and open communication on its advice plans and activities. This will allow for greater input from the Minister on advice themes and could enhance the receptiveness of the Ministry to advice from NACI.*

**Visibility:** The 2008 review had flagged the issue of visibility and urged that NACI reports be made available in the public domain. It appears that this recommendation has not been acted upon since 2009.

To date only three of the 41 NACI Advice Reports ([Appendix 3](#)) produced by NACI during the review period have been published on the NACI website (see table 1 below).

Table 1 NACI Advice reports published on the NACI website

Number	Title	Year
1	Facing the Facts: Women’s participation in science engineering and technology	2009
2	Understanding Mainstreaming: A practical guideline toward mainstreaming gender and disability	2014
3	Gender Mainstreaming and Race Inclusion in the Science Technology and Innovation Public Sector Environment	2016

During the 2018 Review, the Panel was provided with a list of NACI Advice Letters 2009-2018, as well as information about which advice was acted upon. According to the Acting CEO’s information, only three of the research reports on which advice was based were published (see details in [Appendix 3](#)). The broader impact of the advice given therefore remains to be addressed. It seems that NACI held round table discussions on particular themes following which advice was developed. The proceedings of six roundtable discussions were put into the public domain. The acting CEO indicated that they used to request the Minister to allow them to publish the research reports on which advice was based. Often they did not get a response to these requests which was consistent with a general lack of response to the advice which had been submitted.

When proactive advice is sent to Minister it has to be timeous. Advice often has a shelf life and if time has passed it doesn’t shape reactions. Rapidity has impact but so does how well the advice has been structured. Advice provided needs to make specific recommendations related to what’s available to the Minister at the time – also what’s relevant to the Minister’s strategy at that time. Advice provided needs to take those considerations into account.

#### 4.4 The activities of NACI: Structure, process, governance, management and membership

##### Observations

**Too many functions:** The 15 areas in which NACI was expected to provide advice to the Minister and via the Minister to Cabinet were of such a broad nature that the Council was only able to provide advice selectively as the NSI developed over the past two decades. The creation of a limited set of more focussed priorities would be desirable.

**Recommendation 3:** *The Panel recommends a review of the NACI Act and the mandated functions set out in the Act with a view to enhancing NACI’s ability to provide a more focused and effective approach to innovation advice.*

**NACI location and autonomy:** Concerns about the autonomy of NACI as an advisory body as a result of its insertion within the DST were highlighted in the 2002 and 2008 review reports. The 2018 review panel found that the perceptions about the lack of autonomy of NACI because of its structural location had not changed, despite a change first in the arrangement that the DG of DST would no longer be the CEO of NACI and subsequently with the change in the legislation to make provision for a CEO. However, CEO’s have come from the ranks of DST personnel and have not been appointed substantively.

**Recommendation 4:** *The Panel recommends that NACI be constituted as a juristic person by the DST with the Council being responsible for the appointment of the members of the Secretariat and the CEO, as well as for the budget.*

Several interviewees pointed out that NACI is too operationally and administratively linked to the DST. This is seen to compromise its independence, and has raised questions about the autonomy of the advice that has been provided. To some, NACI is seen as a research and advisory entity focused on one ministry when ideally it should play a broader role that includes all government ministries.

Some interviewees pointed to the model of the CHE (also mentioned by the 2008 review panel), that operates as an autonomous statutory body (providing advice to the Minister of Higher Education and Training) as a more suitable model for the advisory function. A different structural location for NACI that is not associated with a single line department (for example, the proposal outlined in the DST's draft White Paper) will address not only the concerns about autonomy but also facilitate a greater Cabinet wide reach for the advice on innovation produced by NACI.

**Composition of NACI Council:** The inclusion of some of the CEOs of science councils in the NACI Council in 2014 was intended to achieve coordination within the NSI, which has long been recognised as a weakness in the current arrangement. Some interviewees among these CEOs saw their participation in NACI as a useful mechanism for acquiring information about the R&D system, through the reports and advice produced by NACI. However, they did not consider their inclusion in NACI as strengthening the interactions with their home departments or influencing their organisational priorities. The intention of increasing cooperation and coordination within the NSI through the inclusion of science council CEOs on NACI does not seem to have yielded the desired co-ordination and has raised questions in relation to the CEOs of entities that were not included in the Council. In fact some interviewees external to the council expressed concern that this arrangement allowed science council interests to dominate the advisory agenda to the detriment of a wider interpretation of innovation.

Many interviewees expressed concern about the absence of civil society organisations on the NACI Council as well as encouraging a more substantial role by the business sector. A number of the council members from the business sector had in fact resigned from the Council since it appears that their conception of their role on the Council did not correspond to the way in which it operated. A reconceptualised NACI Council that includes civil society, organised labour and business – not as political forces but as knowledge generating sectors – could see the emergence of a broader approach to innovation in the advice function.

The size of the Council could be considered relatively large especially when compared to other innovation agencies. ([See Appendix 9.](#)) However, if NACI is transformed into a juristic person, then the diverse expertise recruited to the new council should not be unduly burdened with fiduciary functions, but should be used to provide strategic insights into the advice that is provided. This may require the new council to suggest a modified governance structure to the one the current prevails at most statutory entities.

**Recommendation 6:** *The Panel recommends the inclusion of members from civil society, organised labour and the business sector in the composition of the NACI Council in order to give effect to a broader approach to innovation.*

**NACI's operational approach:** Interviews with the NACI Chairperson, Council members and the acting CEO of the Secretariat revealed that in some instances research production itself, project management of research teams on particular advice themes, and sometimes the writing up of the advice drafts were undertaken by Council members themselves. This approach to the production of advice may

partially be attributed to a lack of capacity in the Secretariat. The Chairperson also explained this as an ‘expert model of advice’ and one which made Council members more connected to the work of NACI. Not all Council members were engaged in such tasks in the process of producing advice. The Council members who undertook these tasks were remunerated for their work. The Panel found this approach to have the potential for a conflict of interest between Council members functioning in their capacity as Council members who then had to arrive at a considered and objective decision on the advice being considered. The Council members who had had been closely involved in the production of the advice and recommendations could potentially be conflicted when the final product was agreed. Such a model could create the perception that the advice in some instances reflected the interests and concerns of particular individuals or task groups rather than being arrived at by consensus of the Council as a whole.

**Recommendation 7:** *The Panel recommends that the NACI Council maintains a clear separation between governance oversight and operational activities and ensures that the operational work relating to the preparation of advice is left to an empowered Secretariat.*

Suggestions for improvement

**Structure of Secretariat:** Without knowing the job profiles of the individuals populating NACI’s organogram found in the 2016-2021 NACI Strategic Plan, it is difficult to determine whether it is fit for purpose. The current organogram has in it a Policy Investigation unit as well as a Policy and Analysis unit. Ordinarily, one would expect that these two units could be a single policy unit of the organisation.

Council is the decision-making location, so to call the person who heads the Secretariat the CEO is anomalous, because they don’t fulfil a position similar to that of the CEO of a science council for example. An appropriate designation for the head of the Secretariat should be considered. The strongly engaged role of some of the Council members should be reconsidered and the capacity of the Secretariat should be enhanced to make this unnecessary.

**Functions of NACI:** The envisaged NACI could have three broad function functions (1) Monitoring and Evaluation (M&E); (2) Policy Advice and (3) NSI Coordination.

The M&E unit would coordinate and advise on M&E functions, bringing together all entities involved in this work including cooperation with the DST, CeSTII, the Department of Planning, Monitoring and Evaluation in the Presidency, statistical authorities; universities; research institutes and others.

- NACI’s monitoring and evaluation function could bring greater value beyond data collection and reporting. Having generated numerous reports and papers in its lifetime, the organisation should be able to gather, integrate and analyse multiple information resources to give a wider perspective of the NSI landscape. The M&E portal that has been initiated should be designed in a way that all role players in the NSI see their activities analysed and contextualised in the portal. The Panel recommends that NACI link to other portals both national and international including the OECD-World Bank Innovation Policy Platform; STIO Compass etc.<sup>12</sup>
- The Policy Unit would address policy gaps and advisory services to the Minister and cabinet. The policy unit can drive: the coordination of science and technology policies and strategies with policies and strategies in other environments [Taken directly from the Act<sup>13</sup>].
- The NSI Coordination function would fulfil a coordination and profiling role within NACI. This unit would ensure that NACI is inclusive in its work and efforts. It would be responsible for

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<sup>12</sup> <https://gdd.oecd.org/subject.aspx?Subject=a2ebc2a0-b8dc-4d1a-82be-3fea780b86a6>

<sup>13</sup> <https://www.gov.za/documents/national-advisory-council-innovation-act>

advice on the coordination and stimulation of the NSI through an inter-ministerial mechanism and the convening of annual government wide meetings on the functioning of the NSI.

A clear delineation of roles, responsibilities and accountability of the NACI Secretariat will assist the Council to play its strategic role more fully.

The recommendations that the Panel makes in terms of the structure of NACI have been influenced by having access to a copy of the draft White Paper, which although not yet finalised and accepted, has very specific recommendations that will affect the future operations of NACI. In addition, it is clear that NACI's role in M&E of the NSI and in the development of decadal plans will place it in a position to have significant influence in policy development. Given the current uncertainty in the environment in which NACI operates, the Panel has developed a number of scenarios that can be used to guide the Council in developing a future path for itself.

**Deficiencies in NACI:** The dearth of civil society and labour representation on the NACI Council was flagged.

In addition, the small and medium enterprises (SME) sector – a subset of private industry – was found to be absent from NACI's agenda. One of the key outputs of R&D effort is knowledge and technologies that ought to be transferred into commercial opportunities. Technologies generated by universities and science councils are mainly taken up by small enterprises in the form of spin-outs or start-ups. The SME sector is important for job creation opportunities, technology competitiveness, manufacturing and export potential. Technology-based SMEs are also instrumental in driving further innovation in the economy. Therefore it is essential that there is strong representation of the SME sector when considering private sector participation on the Council. The issue of representation is addressed below.

**Recommendation 10:** *NACI should strengthen and widen its consultative arrangements for getting input into its advice plans and activities from STI role-players and stakeholders, especially from the business and civil society sectors.*

In order to address the above deficiency NACI may want to consider complementing its activities by exploring examples of a business model innovation agency and by exploring other patterns of innovation. (See the Finnish Research and Innovation Council example in [Appendix 9](#).)

## 4.5 Resources

### Observations

**Concerns about the weakness of the NACI Secretariat** and the challenge this poses to ensuring the effectiveness of NACI were flagged in the 2002 review report and reiterated in the 2008 review report. NACI needs sufficient capacity for high-quality in-house analysis and for guiding the work of a network of research institutions and external experts. The 2018 review panel found this weakness to be unresolved, seriously constraining NACI's ability to give full and credible effect to its mandated responsibilities.

In the nine-year period under review, NACI has had eight heads/CEOs, some of them in office for only a few months' duration. The current head of the Secretariat has been in his position since 2015, but remains in an acting capacity. The attempt to bring stability to the Secretariat appears to founder on the inability to get timeous and appropriate support from other DST line functions. The relationship between the NACI Secretariat and requisite line function sections of DST does not appear to be one that has empowered the Secretariat. The fact that the members of Secretariat are staff members of

DST gives rise to conflicted loyalties and makes it impossible for the Council to be seen as an autonomous entity. The housing of the Secretariat in accommodation away from the DST building has done little to create autonomy or to create a relationship with other role-players in the NSI.

**Recommendation 8:** *The Panel recommends that, with the support of DST, NACI develop a transitional plan or roadmap that will take it from its current state towards the kind of organisation envisaged in the 2018 draft White Paper. Such a roadmap should include proposals relating to a stable and empowered staff complement, a budget that can support NACI's envisaged new mandate and a clear delineation of roles, responsibilities and accountability of the NACI Secretariat to assist the Council to play its strategic role more fully.*

Some members of the Council are deemed to be too involved in operational activities when their focus should be on strategic matters. While it is understandable that the NACI Secretariat lacks resources to carry out its work, it is not ideal for Council members to assume operational responsibilities for the development of advisory reports. At the moment, the work of the Secretariat and involvement of Council is contested space. This has impacted on the nature of Council meetings in that they become more of approval sessions rather than in depth discussions of innovation matters. The current NACI Council has lost several members, a number from the private sector (see [Appendix 6](#)), which is a concern as there is now limited participation of private industry (large and small). There is also a strong call for civil society representation on the Council.

NACI management needs to be considerably strengthened. NACI has had to rely to quite a large extent on the work of consultants and this has resulted in the Secretariat acting more as a procurement centre, managing contracts and doing less of the work itself. The current Acting CEO has demonstrated great aptitude for leading NACI and has started to implement positive changes in the organisation. As NACI moves towards a more functional structure with in-house capacity and capability, a change management process is required to ensure a smooth transition.

There was an attempt to review the skills profile of existing staff in the existing post structure (there are 13 positions, 12 of which are filled); but this process appears to have stalled. It is not clear why this matter has not received concerted high-level attention given that it was identified as a serious problem almost 16 years ago in the first review report. Some interviewees saw this as a reflection of the lack of seriousness with which NACI has been treated as an advisory body despite its formal legislative mandate. For NACI to have a credible and effective role and presence in the NSI, one crucial prerequisite is the strengthening of the NACI Secretariat through the appointment of a permanent CEO and capable senior staff who will be able to take the initiative and responsibility of generating proposals and managing research and consultation processes in order to provide full support to the NACI Council in discharging its advice function. The absence of this capacity in the Secretariat has led to an unfortunate situation where Council members have become involved in what are in effect Secretariat functions.

NACI does not have dedicated support resources such as HR, IT, Finance etc. This has significantly hampered the organisation's ability to operate efficiently and effectively. As a small organisation, NACI needs to be agile and nimble, and currently it is not achieving this.

**Concerns in relation to the budget.** NACI has a history of underspending on recent budgets. Projects may not be completed on time and hence have to be carried over with impacts on the budget. The lack of continuity in the position of CEO has undoubtedly impacted on planning by the Secretariat and given rise to slippage in the completion of projects and to the problems with expenditure of the budget.

The NACI allocated budget for 2016/17 was R18, 8 million, including compensation of employees. The expenditure on goods and services from the annual budget was R8,2 million of which NACI expended R5,7 million resulting in an under-expenditure of R2,4 million. Accumulated savings in respect of goods and services occurred as a result of the development of national STI data and information portal internally.

In 2017 NACI saved a significant amount of money by developing the STI portal internally with support from the DST IT department. Whether this was an optimal way to the development of the portal remains to be seen. However, the fact that the NACI website is not current suggests that the Secretariat should have direct control over its operations. The Review Panel feels that until NACI is able to spend what can be described as a relatively small budget for such an entity, there will be reluctance to even estimate what the size of the budget should be. The make-up of the Secretariat has relevance in this regard because until NACI has a proper structure that speaks to their work that they are expected to undertake, they will not be able to make appropriate budget estimates.

While NACI's budget is small, one would caution against increasing it without a clear plan for its future development and a business plan that supports this plan. The proposed plan together with the recommendations of this review can be used to inform changes required in the NACI Act. As NACI transitions from using consultants to deploying in-house capacity, future budgetary needs must be planned for early, to avoid financial constraints hampering progress.

**Human resources in domain of policy studies:** There is a national challenge regarding capacity development to do the kind of work that organisations such as NACI should be doing. Members of the Review Panel expressed a wish to see more human capacity development (HCD) across science, engineering, technology and innovation institutions and within NACI itself. The same actors who have been doing most of the consulting work for NACI are still active, there is little increase in this capacity either within NACI or more broadly in the NSI.

**Human resources for STI analysis:** Despite the major investment in human resource capacity development via the higher education sector and the NRF, the interviewees (with few exceptions) indicated that these interventions had not succeeded in generating a new cohort of policy researchers, data gatherers and analysts who were sufficiently familiar with the workings of the NSI to have a system-wide understanding of STI problems and challenges. Drawing on research organisations that are associated with organised labour, civil society structures and business fora would certainly help to enlarge and diversify the profile of those working in the field of innovation policy and practice, but the need for policy specialists to be recruited to the core staff of the NACI Secretariat is an imperative, as is the generation of loci of policy research within the higher education sector. Development of this analytical and strategic capacity is urgently required.

Strategic investments in the South African Research Chairs Initiative (SARChI) and the Centres of Excellence (CoEs) particularly in relation to the development of expertise in policy analysis has started to bear fruit. Graduates from these programmes could potentially provide the expertise required to enhance the capacity of the NACI secretariat and other entities concerned with providing analytical and advisory services to government and civil society.

NACI should have the capacity to produce well respected work that is the result of its own efforts and of working together with others. They should also guide those who are working in this policy advisory domain.

Where is the new cohort of experts? Where is the new policy and analytical capacity that will be needed in the future?



Training within this field is currently limited and there is little recognition of the potential job prospects that could exist if NACI's functions were scaled up. Going forward NACI and other role-players in this domain need to consider whether they should engage with the Global Young Academy and the South African Young Academy of Science since they have programmes for science leaders and for the engagement of scientists with both *science for policy* and *policy for science*.

It is important that NACI develop a transitional plan or roadmap that will take it from its current state to the kind of organisation envisaged in the draft White Paper. For NACI to successfully migrate to the desired state, a significantly different staff complement is required to fulfil the requirements of a functional organisation as described above. NACI will need to develop its staff such that it is able to operate within the functional roles envisaged in the future NACI. Where there are gaps in staff capability various mechanisms to build capacity should be explored and implemented. Although in the past the universities have been involved in generating reports, NACI could look at bringing in university students to join the Secretariat for a period of time (at least six months). This could contribute to the capacity building of NACI. The potential for more of a revolving door between academia and government is really quite rich. This would create a better understanding for the students and bring sharper focus of expertise into NACI.

Resource requirements will depend on which of the scenarios for the future become a reality for NACI ([see Recommendation 8](#)).

## 5. Scenarios for the future

The major recommendation to emerge from the 2008 NACI Institutional Review revolved around a call to address the issue of reporting relationships, particularly to ensure that NACI reaches its full potential. The text reads:

*“Two issues need to be addressed to ensure that NACI reaches its full potential as the policy advisory body to government on innovation. The first relates to the level and breadth at which NACI reports to government to ensure that it is taken seriously and that the right level of coordination is ensured, while the second relates to the administrative arrangements in place to ensure its independence and ability to resource the right people, both for the Council and the Secretariat.”*

This report argued that for NACI to meet its mandate, then its positioning in government should be considered through two options, with the 2008 Review Panel's preference being the second option.

**Option 1:** *NACI stays in the DST, but a number of important changes are implemented. These include that the CEO/Head of Secretariat reports directly to the Minister and that the position is elevated to be similar in level to that of the heads of science councils. The budget would still reside in the DST, but in the form of a single line item, and the DST would continue to provide administrative support functions. The Council and CEO of the Secretariat would be fully responsible for NACI, including managing the finances and affairs according to the PFMA (in other words, DST would not have an oversight role with respect of NACI at all).*

**Option 2:** *To optimally solve the issues identified, we propose the formation of a Ministers' Council on Innovation (MCI). We propose that this Council be appointed and chaired by the President, with the Minister of Science and Technology serving as Deputy Chairperson of the Council and playing a leading role of coordination, in keeping with his present role of coordination in the NSI. The other members of the MCI would be key Ministers in the innovation space, such as the Ministers of Trade and Industry, Education, Health,*

*Communication, Public Works, Public Enterprises and National Treasury. The Chairperson of the NACI Council and CEO/Head of the NACI Secretariat would advise the MCI on the deliberation and advice from NACI.”*

Chairs of the NACI Council have adhered to the advisory role for the institution as originally defined in its Act. Pistorius underlined this role when he emphasised that NACI products should be largely advisory and strategic; and that it should not engage in policy implementation.<sup>14</sup>

## Observations

The future challenges faced by NACI and other organisations include adapting to global transformation i.e. the Fourth Industrial Revolution, Industry 4.0 or Society 5.0.

NACI’s strategic outcome-oriented goals include: learning from previous experience to improve efficacy, relevance and ensure evidence-based, confidential and timely STI advice; to contribute to the building of NSI monitoring, evaluation and learning (MEL) capability in order to assess the health of the NSI and its contribution to sustainable and inclusive development; and to contribute to the building of a well-coordinated, responsive and effective NSI.

The draft White Paper of May 2018 proposes to extend the mandate and tasks of NACI. The conclusions of the Review Panel therefore include a forward-looking component which was analysed by way of envisaging three different scenarios which could be used to transition the current NACI to a desired future state.

The three scenarios we consider are:

**1. Revised current scenario:** NACI continues to operate under the current statutory dispensation but is given greater autonomy from DST (to appoint and manage its own staff and the CEO). Procedures are put in place to extend its advice to Cabinet as a whole. The financial resources and staff capacity of the Secretariat is strengthened over time.

**2. Extended ‘services’ function scenario:** With a substantial revision of the NACI Act, NACI is given an extended mandate and additional resources to deliver innovation advice and services to the Cabinet. Services that would be additional to its advisory role could include the implementation of Monitoring and Evaluation (M&E) of the performance of the NSI, Foresight Studies; stimulating and consolidating coherence and connectivity in the NSI; and contributing to the productive functioning of the NSI in general. More implementation services could be added to NACI’s portfolio as required (e.g. CeSTII).

**3. Extended advisory function scenario:** With a substantial revision of the NACI Act, NACI provides advice to the Cabinet (cf. the inter-Ministerial Committee proposed in the draft White Paper) and to relevant actors in the STI system. This includes the R&D sector of the science councils and the universities, the business sector and civil society (cf. the occasional reference to Quadruple Helix in the draft White Paper). NACI’s advisory function will include *advice* on Monitoring and Evaluation (M&E) via the publication of indicators, *advice* on Foresight Studies; *advice* on stimulating and consolidating coherence in the NSI, and the productive functioning of the NSI in general via the inter-ministerial committee.

The Panel was of the view that Scenario 1 provides for too limited a capacity for NACI and should be regarded as a transitional step in the direction of one of the extended scenarios. The extended ‘services’ scenario provides for a NACI that has both an advisory function and aspects of an

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<sup>14</sup> *Providing science advice to government in South Africa: Review and proposals*, Prof Calie Pistorius, University of Pretoria, August 2008

implementation function. Such as scenario was not favoured by the Panel since it was of the view that implementation of policy should reside with the relevant government departments and not compromise the advisory function of the Council.

**Recommendation 12:** *The Panel recommends the extended advisory function scenario as the most appropriate one to support and strengthen the further development of the NSI. This is the scenario largely envisaged in the draft White Paper and it could provide for the transformation of NACI into an autonomous and focused advisory body with national impact.*

An advisory council will need data and evidence to offer good advice, but the key is a good diagnosis of the situation and possible social and political implications. Consider also the case that the advisory council wants (needs) to come up with a critical diagnosis of the overall framing in terms of a national system of innovation.

The new NACI would require careful planning to ensure the development of existing staff and a plan to bring on board new staff of the kind required to fulfil the expanded mandate.

To drive innovation in a comprehensive manner, a structure that transcends a single line function department should be in place. The concept of an inter-ministerial committee would allow NACI to coordinate its national objectives throughout the NSI. During the past nine years the DST has managed to make science and technology a key sector within Cabinet. This had not always been the case in the past. Former Minister Pandor believes therefore that the White Paper needs to be ambitious. “The moment is right and this should not rely on Ministers being asked to come together but should be specified in policy. There should be legislative provision to follow the White Paper to create space for ministries to meet and mandate a technical committee of senior officials responsible for ensuring the foundational work on innovation in its broadest sense will be done i.e. a legislated coordinating body.”

NACI would still have an advisory role and would still have to do the research necessary to develop the policy advice. This formal body would refer work to NACI and hence elevate NACI’s role.

If the coordinating body in the White Paper becomes a reality, this would create opportunities for other ministries to be aware that there’s an advisory body in the system – NACI. Ministries are currently not fully alert to the capacity that’s available in NACI, if the White Paper is approved and implemented in its current form, then NACI will become more visible and relevant.

### **Migrating NACI from where it is now to the desired state**

While expressing concern that NACI already has too many functions, the Panel also suggests considering expanding the mandate of NACI to elevate it to the desired state. This desired state foresees a NACI that provides advice across Cabinet and to relevant actors in the system. It is an autonomous advisory body with national impact. This expanded mandate will require additional resources.

The migration will require a plan that addresses the following:

- (a) A review of the organisational design, ensuring that it is fit for purpose;
- (b) Determining staff development and training requirements;
- (c) Changing the Annual Performance Plan (APP) and Strategic Plan starting in 2019; and
- (d) Determining current and future resourcing needs.

The new NACI will require:

- (a) Amendments to the ACT (actual amendments need to be determined);

- (b) Mechanisms to develop staff in NACI to be able to play different roles in the organisation;
- (c) Significant resource commitments, especially with respect to administrative support areas;
- (d) Appointment of a substantive CEO with the authority to manage and run the operations of the Council and answerable to the Council and not to DST;
- (e) Strengthening executive leadership in NACI to implement the desired changes in the organisation; and
- (f) Attract specialists to fulfil its more functional role. This will require attracting high calibre people who are likely to command higher salaries.

The NACI Act should be the starting point to redefine the mandate of NACI. Some of the interviewees felt that the Act needs to be clear in determining NACI's status. The current Act is non-committal in stating that NACI should provide advice on the role of innovation. Instead it should state that NACI should provide advice on the impact of innovation driving issues of quality of life and provide advice that informs the plans of government. The new Act requires more actionable interventions, more institutional credibility and more impact.

However, it is possible to improve performance even without making legislative changes. This can be achieved by ensuring an improved composition of Council by drawing in representation from the business sector, civil society organisations and labour. As mentioned earlier this reconceptualised NACI Council could see the emergence of a broader approach to innovation in the advice function. In addition, there could be ways to formalise and improve channels of communication with other Ministries and the public. More regular meetings with the Minister are required and these could be proactively requested by NACI.

#### **Current activities**

The successful execution of NACI's current activities as [outlined in Appendix 7 below](#) are likely to give NACI additional visibility, but they are still largely confined to the policy domain of DST. NACI's cabinet level impact needs to be ensured via the acceptance of the proposals in the White paper.

Finally, we would like to see more technology assessment incorporated into the activities of NACI. This scientific, interactive, and communicative process that aims to contribute to the formation of public and political opinion on societal aspects of science and technology could play a valuable role in South Africa.<sup>15</sup> NACI could look at some of the new ways in which technology assessment is being done e.g. *Horizon 2020*, which is the biggest European Union research and innovation programme ever. It is designed to take great ideas from the lab to the market and is seen as a means to drive economic growth and create jobs. *Horizon 2020*<sup>16</sup> demands science engagement and co-creation of the research agenda. Social acceptance of new technology needs science engagement.

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<sup>15</sup> Cf. the commonly used definition given in the report of the EU-funded project TAMI (Technology Assessment – Methods and Impacts) in 2004: <https://www.ta-swiss.ch/?uid=45?uid=45>

<sup>16</sup> <https://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

## 6. Thank you

The Review Panel would like to thank the NACI leadership and staff (past and present) for their participation and assistance. We would like to thank all participants for their frank discussion of NACI activities over the review period– from the Ministers to Members of Council and external stakeholders. Thank you to the team in the Secretariat for organisational and logistics support and for assistance with all of our requests.

Finally, the Panel would like to thank Kim Trollip for being an excellent scribe and keeping track with good humour of all the versions of the report that were produced.

## 7. Acronyms

ASSAf	Academy of Science of South Africa
CeSTII	Centre for Science, Technology and Innovation Indicators
CHE	Council on Higher Education
CoEs	Centres of Excellence
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DHET	Department of Higher Education and Training
DST	Department of Science and Technology
DWS	Department of Water and Sanitation
DTI	Department of Trade and Industry
ExCo	Executive Committee
HCD	Human capacity development
HEIs	Higher education institutions
HSRC	Human Sciences Research Council
IDC	Industrial Development Corporation
IKS	Indigenous knowledge systems
KISTEP	Korea Institute of Science and Technology Evaluation and Planning
MCI	Ministers' Council on Innovation
M&E	Monitoring and evaluation
MEL	Monitoring, evaluation, and learning
NACI	National Advisory Council on Innovation
NCRI	National Council on Research and Innovation
NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
NISTEP	Japan National Institute of Science and Technology Policy
NRF	National Research Foundation
NSI	National system of innovation
OECD	Organisation for Economic Cooperation and Development
PFMA	Public Finance Management Act
R&D	Research and development
RCN	Research Council of Norway
SACNASP	South African Council for Natural Scientific Professions

SARChI	South African Research Chairs Initiative
SciSTIP	DST-NRF Centre of Excellence in Scientometrics and Science, Technology and Innovation Policy
SDGs	Sustainable Development Goals
SETIs	Science, engineering and technology institutions
SME	Small and medium enterprises sector
SOEs	State-owned enterprises
STATsSA	Statistics South Africa
STI	Science technology and innovation
TIA	Technology Innovation Agency
TIP	OECD Working Party on Innovation and Technology Policy



## 8. Appendices

- Appendix 1: Terms of Reference for the 2018 NACI Institutional Review
- Appendix 2: List of interviewees
- Appendix 3: NACI Advice Letters (Advice Letters produced by NACI during the period under review including those commissioned by the Minister, those proactively produced by NACI and the fate of the advice.)
- Appendix 4: NACI Heads of Secretariat 2009-2017
- Appendix 5: NACI Strategic priorities in the policy context
- Appendix 6: Members of Council 2009-2013 and 2014-2018
- Appendix 7: NACI Structure, operations and activities
- Appendix 8: The trajectory of NACI 2009-2017
- Appendix 9: Comparative analysis of innovation systems from around the world

## Appendix 1: Terms of Reference for the Review of the National Advisory Council on Innovation, April 2018

### 1. Introduction

The National Advisory Council on Innovation (NACI) is a statutory body established in terms of the National Advisory Council on Innovation Act, 1997 (Act no 55 of 1997). NACI advises the Minister of Science and Technology and, through the Minister, Cabinet, on various matters pertaining to science, technology and innovation (STI) in South Africa. The Council places great emphasis on providing evidence-based advice that is confidential, valuable and relevant. NACI utilises available research expertise and round-table discussions to access and mobilise views and inputs in the national system of innovation (NSI).

Since its inception, NACI has subjected itself to external reviews. The last external review occurred in 2008. It has therefore, become necessary to conduct another review covering the period between 2009 and 2017.

### 2. Purpose

The purpose of the review will be to:

- Provide a retrospective view on the performance of NACI in terms of its
  - legislative mandate;
  - strategic objectives.
- Provide critical views on possible gaps not addressed by NACI in terms of the NACI Act (Number 55 of 1997 as amended in 2011).
- Assess the extent to which the recommendations of the previous review in 2008 have been addressed.
- Assess the effectiveness of the organizational governance, operational structure, management and resourcing.
- Offer recommendations regarding the future strategic direction and operational execution of the NACI mandate. In this regard, understanding and interpreting the prevailing local and international conditions or context as well as emerging trends in science technology and innovation (STI) systems).

### 3. Panel membership/establishment

The Council is accountable for the establishment of the review panel and outcomes of the institutional review.

#### The role of Executive Committee (ExCo) is to

- approve the terms of reference (ToR);
- identify/approve the review panel;
- consider and suggest suitable interviewees for the review panels;
- accept the final report from the review panel as well as the overall NACI response;

- take responsibility for briefing the review panel;
- provide comments and recommendations on the review process and the extent to which the ToR for the review have been addressed;
- engage the Council (possibly through the Acting CEO) on the outcome of the review and formally request the Council members to take up the findings and recommendations with the Minister of Science and Technology as well as other relevant Government Departments;

The review panel will consist of at least 7 members. Two members of the review panel should be international experts. The review panel may request additional technical capacity.

**Panel of experts:**

- Prof Robin Crewe, Centre for the Advancement of Scholarship, University of Pretoria (Chairperson)
- Dr Yuko Harayama, Executive Member, Council for Science, Technology and Innovation, Cabinet Office, Japan
- Mr Gernot Hutschenreiter, Head of Country Reviews and Outlook Division, OECD, Paris
- Professor Thiago Renault, Department of Administrative and Accounting Sciences of the Federal Rural University of Rio de Janeiro, Brazil
- Prof Arie Rip, Professor of Philosophy of Science and Technology in the School of Management and Governance of the University of Twente
- Prof Mala Singh, NRF Board member, former CHE Executive Director
- Dr Sibongile Gumbi, Independent Consultant; former Group Executive Technology Innovation Agency

The NACI Secretariat will provide the necessary administrative and technical support as and when required to do so. The Secretariat will prepare information documentation for each of the Panel members before the commencement of the review period. It will also prepare list of interviewees and arrange interviews.

**4. Roles and responsibilities of the Review Panel**

The Review Panel members will have the opportunity to interview members of Council (both current and past), NACI Secretariat, government (especially Department of Science and Technology), relevant National System of Innovation (NSI) stakeholders as well as other key national stakeholders who are also users of NACI reports.

- a) Guided by Council, the Review Panel will decide on and pursue their own line of questioning during the interviews.
- b) The Review Panel will provide feedback on completion of the review to members of the Council, ExCo and senior officials of the DST. The Review Panel will be expected to present a draft and/or final report if and when it is requested by the Minister.
- c) The Review Panel will provide a final report within the timeline given below. The report should include:

- i. an executive summary and background to the review;
- ii. evaluation questions that were addressed;
- iii. key findings;
- iv. conclusions and recommendations;
- v. appendices containing, e.g. ToR, persons interviewed etc.

## **5. Timeframes**

Preparations for the review will commence in 2017 but the programmes involving the reviewers will take place in the first half of 2018 depending on the availability of suitable reviewers.

- Establishment of the Review Panel done
- Review Panel convener and Chairperson Prof Robin Crewe
- Review Panel briefing by panel Chairperson and NACI leadership (at venue) 15 May 2018
- Review Panel meeting 1 (at venue) 15 May 2018
- Evening of 15 May -dinner at venue with NACI Chairperson and acting CEO
- Review Panel interviews 16, and 17 May 2018
- Review Panel overflow interviews and final discussion to capture inputs in the Review Report 18 May 2018
- Compilation of the Review Report May/June 2018
- Draft report submission and Review Panel meeting 2 final discussion 15 June 2018
- Final report and recommendations 29 June 2018

**The ToR may be amended should the need arise.**

## Appendix 2: List of interviewees for the 2018 Institutional Review

List of interviewees for the 2018 Institutional Review		
1. Minister Naledi Pandor	Former Minister of Science and Technology, current Minister of Higher Education	Face-to-face/Skype/telephonic
2. Minister Kubayi-Ngubane	Minister of Science and Technology	Face-to-face/Skype/telephonic
3. Dr Mlungisi Cele	Acting Chief Executive Officer: NACI	Face-to-face/Skype/telephonic
4. Prof Cheryl de la Rey	Chairperson of Council: NACI and Vice Chancellor: University of Pretoria	Face-to-face/Skype/telephonic
5. Prof Jennifer Thomson	ExCo: NACI and Emeritus Professor: Department of Molecular and Cell Biology, University of Cape Town	Face-to-face/Skype/telephonic
6. Mr Dhesigen Naidoo	ExCo: NACI and Chief Executive Officer: Water Research Commission	Face-to-face/Skype/telephonic
7. Ms Ilse Karg	Acting Chief Director: Future Production Technologies and Industry, Department of Trade and Industry	Face-to-face/Skype/telephonic
8. Dr Azar Jammie	Director and Chief Economist: Econometrix	Face-to-face/Skype/telephonic
9. Ms Clare Buseti	Executive: SiMODiSA	Written input
10. Prof Roseanne Diab	Executive Officer: Academy of Science of South Africa	Face-to-face/Skype/telephonic
11. Prof Crain Soudien	Chief Executive Officer: Human Sciences Research Council	Face-to-face/Skype/telephonic
12. Mr Paul Steenkamp	I am Jack Frost	Face-to-face/Skype/telephonic
13. Dr Thulani Dlamini	Chief Executive Officer: Council for Scientific and Industrial Research	Face-to-face/Skype/telephonic
14. Dr Phil Mjwara	Director General: Department of Science and Technology	Face-to-face/Skype/telephonic
15. Mr Martin Mulcahy	Special Advisor to Minister Pandor	Face-to-face/Skype/telephonic
16. Prof Loyiso Nongxa	Chairperson of the Board: National Research Foundation	Face-to-face/Skype/telephonic
17. Prof Rasigan Maharajh	Chief Director: Institute for Economic Research on Innovation, Tshwane University of Technology and nodal head DST-NRF Centre of Excellence for Scientometrics and Science, Technology and Innovation Policy	Face-to-face/Skype/telephonic
18. Dr Steve Lennon	Former Chairperson of Council: NACI, Managing Director: Shanduvan and Director: Fusion Energy Holdings	Face-to-face/Skype/telephonic
19. Prof Ahmed Bawa	Chief Executive Officer: Universities South Africa	Face-to-face/Skype/telephonic
20. Prof Johann Mouton	Director: Centre for Research on Evaluation, Science and Technology and DST-NRF Centre of Excellence for Scientometrics and Science, Technology and Innovation Policy	Face-to-face/Skype/telephonic
21. Prof Anastassios Pouris	Director: Institute for Technological Innovation, University of Pretoria	Face-to-face/Skype/telephonic

22. Prof Michael Kahn	Extraordinary Professor: Faculty of Economic and Management Sciences, University of the Western Cape and Technology and DST-NRF Centre of Excellence for Scientometrics and Science, Technology and Innovation Policy	Face-to-face/Skype/telephonic
23. Prof Salim Vally	Director: Centre for Education Rights and Transformation, Faculty of Education, University of Johannesburg	Written input
24. Mr Barlow Manilal	Chief Executive Officer: Technology Innovation Agency	Written input
25. Prof Saurabh Sinha	Deputy Vice Chancellor: Research and Internationalisation, University of Johannesburg	Written input
26. Ms Jansie Niehaus Murcott	Executive Director: National Science and Technology Forum	Written input

## Appendix 3: NACI Advice Letters

Topic or theme of submission	Date submitted	Commissioned by Minister	Proactively produced by NACI	Response received by NACI about the fate of the advice
Advice on Management of National Facilities for Research and related issues	22 March 2012	Response to the NRF's invitation to comment on its document on the Positioning of the National Research Facilities as well as the Request by the Minister on the management of the National Research facilities		
Issues affecting food security in South Africa	30 June 2015		Produced by NACI	The relevant DST programme has provided feedback to the Minister. The DST has written to both the Department of Rural Development and Land Reform and Agriculture, Forestry and Fisheries, soliciting views on the report.
Advice on issues relating to the Sustainable use of Biomass in South Africa	19 August 2015		Produced by NACI	The Minister has written to NACI, advising that the report not be published, but further inviting NACI for a discussion on how the policy briefs of NACI, may be enhanced (they referred to the work on biomass, food security and the implementation of the bio economy strategy).
Policy briefs on food security, sustainable use of biomass and implementation of bio economy strategy	3 May 2016		Supplement advice letters (1) issues relating to the sustainable use of biomass in South Africa submitted to the Minister in August 2015	
Ministerial advice intended to improve interactions of South African Government with its African Counterparts on Science & Technology Initiatives	16 November 2009	Concern raised by the former South African Minister Mr Mosibudi Mangena, concern that certain S&T decisions that were taken elsewhere in Africa might have an impact on SA and its NSI		



Advice on addressing barriers for Women in Science, Engineering and Technology	27 June 2012		Produced by NACI	
Funding Basic Research in Biotechnology and providing incentives to bio entrepreneurs	August 2012		Produced by NACI	
Genomic Sovereignty in South Africa	August 2012		Produced by NACI	
Problems encountered with delays in appeals to decisions made by the executive council of the GMO Act	August 2012		Produced by NACI	
Principles and good practice guidelines for enhancing the participation of women in SET	25 October 2010		Produced by NACI following the advice submitted to the Minister in February 2009 entitled "Enhancing the participation of Women in SET: a Summary of Good Practices"	
Performance of Grade 12 Learners in Mathematics and Science	26 September 2007		Produced by NACI	
Skills and Education for NSI Human Capital Development	19 March 2012		Produced by NACI	
Scalable Social Innovations to enhance their impact on social upliftment	15 June 2012		Produced by NACI	
Technology Balance of payment as an STI indicator	26 August 2009	Follow up on request for information on the Technology Balance of Payment as an STI Indicator		
NACI's view on the Ten-Year Innovation Plan: Innovation towards a knowledge-based economy 2008-2018	16 November 2009	Request at the Council meeting of June 2009, NACI to evaluate the extent to which the grand challenges are aligned to national priority areas		
Role of Private Venture Capital in the National System of Innovation	12 July 2016		Produced by NACI	

SET of advice on two projects entitled (i) an assessment of the participation of Women in the science, engineering and technology industry and (ii) changing perceptions of women in science, engineering and technology	15 January 2008		Produced by NACI	
Potential Role of indigenous technologies in meeting the targets of the National Development Plan	11 November 2015		Produced by NACI, based on a commissioned study on indigenous knowledge systems (IKS) flagship projects and technologies	The Minister identified the need for the further institutionalisation of IKS, through relevant policy and legislative frameworks, human capital and skills development initiatives, inclusion of knowledge holders and communities, and financially supporting progressive strategies and implementation plans. It is important to also note the legislative process currently underway on the IKS Bill, which Parliament is processing. The Minister further expressed support for the publication of the NACI report.
Advice on development of the National STI Portal	21 December 2015	Request by the Minister		As soon as this work is completed, the DST will see how it can be integrated and interface with the DST's and other relevant information systems such as the performance information management system and the research information management systems
Advice on issues relating to the sustainable use of biomass in South Africa	19 August 2015		Produced by NACI	The Minister has written to NACI advising that the report not be published, but further inviting NACI for a discussion on how the policy briefs of NACI, may be enhanced (the letter referred to the work on biomass, food security and the implementation of the bio economy strategy)

Advice on the results of the 2012-13 Research and Experimental development survey	25 June 2015	Request by the Minister		
Advice on the results of the 2015 South African STI Indicators Booklet	30 March 2016		Produced by NACI	
Advice on Social Impact programme of DST	9 December 2010			
Raising South Africa's Investment in R&D: Venture Capital – A Mechanism for achieving the DST target of 1.5% of GDP by 2014	3 August 2010		Produced by NACI	Minister referred the advice to the Minister's advisor for consideration on core issues in the study
An investigation into the reasons why certain biotechnology Enterprises have failed in South Africa	8 July 2014		Produced by NACI	
Analysis of key issues in South Africa's prospective Nuclear Procurement programme	25 February 2016		Produced by NACI	
Analysis of skills sustainability in government infrastructure flagship projects	7 March 2016		Produced by NACI	The Minister indicated that in response to the Synthesis from NACI, the Minister informed that the DST has engaged both the HSRC and the DHET, in order to place the report in context. Subsequently, the report has been referred to the DHET who are responsible for skills planning. The DST would facilitate NACI's participation in appropriate platforms.
Energy efficiency and demand side management still come to rescue	9 March 2016		Produced by NACI	Minister referred the advice to the special advisor for further inputs.
Mitigating Gender disparities in the science, technology and innovation environment (STI)	7 July 2014		Produced by NACI following a discussion between Council and the Minister on the representation of women in the STI.	In responding to the recommendations, the Minister expressed support for the recommendations, recommended that the report be shared with the Department of Women, and supported further discussion between NACI and other public entities. It is important to note that the DST is

				currently in the process of developing a gender mainstreaming strategic framework for the NSI. The NACI work in this area will be useful in this respect.
<b>Gender Mainstreaming and Race Inclusion in the Science Technology and Innovation Public Sector Environment</b>	7 March 2016		Produced by NACI	In responding to the recommendations, the DST expressed support for the recommendations, recommended that the report be shared with the Department of Women and supported further discussion between NACI and other public entities. It is important to note that the DST is currently in the process of developing a gender mainstreaming strategy framework for the NSI. The NACI work in this will be useful in this respect.
<b>Legislation and policies that affect the implementation of bio economy strategy</b>	8 July 2014		Produced by NACI	
<b>Maximising support for upscaling impactful innovative solutions and for growth and innovation based SMME</b>	7 July 2014		Produced by NACI	
<b>Position paper on the National Research Facilities and related issues</b>	20 March 2012		Produced by Prof Bharuth-Ram	
<b>Presentation of the consolidated work programme of NACI Council for the 2013-14 Financial year</b>	15 July 2014		Produced by NACI Outgoing NACI Council presented the completed work programme of Council for the financial year as outlined in the NACI APP 2013/14	
<b>Rapid response to Water and Sanitation Challenges</b>	3 February 2016		Produced by NACI Based on the 2016 World Economic Forum Global Risk Report	The Minister indicated that the Rapid Response Advice from NACI, is aligned to the Water Research Development and Innovation (RDI) Roadmap. The Minister further committed to

				working with the Department of Water and Sanitation, in considering the recommendations of the Rapid Response from NACI.
Research and Innovation Infrastructure in support of an internationally attractive innovation framework for South Africa	7 July 2014		Produced by NACI	
Strengthening Science Technology and Innovation Skills for the South African National System of Innovation (NSI)	7 July 2014		Produced by NACI Based on the results of work done by NACI on strengthening of skills in mathematics, science and technology in the context of supporting innovation outcomes.	
Development of a framework of indicators to measure the contribution of the South African Bio-economy to the South African GDP				A submission en route to the Minister from Programme 2 (Technology Innovation) advising NACI not to proceed with the work
Review of the 1996 White Paper		Request by the Minister		Done and discussed with the Minister and Department. The report was supplemented by Situational Analysis and Synthesis Report
Performance analysis of NSI		Request by the Minister		Done and presented at the Ministerial Budget Vote Luncheon. The report was accompanied by the Situational Analysis and Global Trend analysis reports
Development of high-level framework for the White Paper and Decadal Plan		Request by the Minister		This is still outstanding

#### Appendix 4: NACI Heads of Secretariat 2009-2017

Name	Period
Mr Vuyani Lingela	March 2007 - 2009
Dr Bok Marais	April 2009 to July 2009
Dr Krish Bharuth-Ram	July 2010 to 2012
Ms Kelebogile Dilotsotlhe	July 2012 to February 2013
Mr Thulani Mavuso	May to October 2013
Ms Nozipho Maome	October 2013 to January 2015
Mr Tommy Makhode	May 2015
Dr Mlungisi Cele	August 2015 to date

Appendix 5: NACI Strategic priorities in the policy context

**Table 1: Strategic priorities in the policy context**

NACI Strategic Plan 2015-2020						
Strategic Goal		Strategic Objective		Outcome	Indicator	Policy linkages
1	Facilitate agenda setting for STI	1	To provide advice to the Minister & Cabinet on medium to long-term priorities for STI	A coordinated and stimulated NSI	<ul style="list-style-type: none"> <li>A Framework for a "Decadal Plan"</li> <li>Stakeholder consultation</li> </ul>	<ul style="list-style-type: none"> <li><b>National Planning</b> <ul style="list-style-type: none"> <li>National Development Plan (NDP)</li> <li>Medium Term Strategic Framework (MTSF)</li> <li>SONA 2015</li> </ul> </li> <li><b>Major Economic Policy Frameworks</b> <ul style="list-style-type: none"> <li>New Growth Path (NGP)</li> <li>Industrial Policy Action Plan (IPAP5)</li> </ul> </li> <li><b>Science and Technology</b> <ul style="list-style-type: none"> <li>White Paper on Science and Technology "Preparing for the 21<sup>st</sup> Century" (1996)</li> <li>National Research and Development Strategy (NRDS) 2002</li> <li>The Ten-Year Innovation Plan (TYIP) 2007</li> </ul> </li> </ul>
2	Advice on conducive framework conditions for STI	2	To review the White Paper on Science and Technology and associated strategies	An enabling environment for STI to contribute to economic growth	<ul style="list-style-type: none"> <li>A discussion document on the review of the White Paper</li> <li>Stakeholder consultation</li> </ul>	
3	Monitor and evaluate the STI contribution to SA's economic growth and competitiveness	3	To conduct a review of a state of Innovation in South Africa	The status of innovation in the country effectively and efficiently monitored; and- The contribution of STI to economic growth and competitiveness will become evident	<ul style="list-style-type: none"> <li>Innovation Scorecard</li> <li>A framework for an innovation portal</li> <li>State of National Innovation Report</li> </ul>	
4	Establish NACI as a premier institution for providing rapid response advice	4	To develop and implement a rapid response advisory system	Responsiveness to requests for advisory services	<ul style="list-style-type: none"> <li>Rapid response manual</li> <li>Rapid response advice</li> <li>Uptake of advice</li> </ul>	



## Appendix 6: NACI Council Members

NACI Council 2009-2013		
1.	Dr Steve Lennon <b>NACI Chairperson</b>	Managing Director: Resources & Strategy, Eskom
2.	Dr Phil Mjwara <b>NACI CEO</b>	Director-General: Science and Technology
3.	Mr Paul Baloyi (resigned)	MD and CEO: Development Bank of Southern Africa
4.	Dr Ntuthuko Bhengu (resigned)	Executive Head: Provider Networks Qalsas (Pty) Ltd
5.	Mr Kuseni Dlamini	
6.	Dr Azar Jammie	Director and chief economist, Econometrix
7.	Prof Helen Laburn	Deputy Vice-Chancellor (Research), University of the Witwatersrand
8.	Prof Lineo Vuyisa Mazwi-Tanga	Cape Peninsula University of Technology
9.	Ms Khungeka Njobe (resigned May 2012)	Managing Director: Aveng Water
10.	Prof Nthabiseng Ogude (resigned 19 July 2012)	Deputy Vice Chancellor, University of Pretoria
11.	Prof Michael Pepper	Professor: Unit for Advanced Studies, University of Pretoria
12.	Prof Francis W Petersen	University of Cape Town, Dean of Engineering and the Built Environment
13.	Prof Mamokgethi Phakeng (resigned 21 February 2014)	Vice Principal: Research & Innovation, University of South Africa
14.	Dr Johannes Potgieter (resigned)	Chief Director: Innovation and Technology, Department of Trade and Industry
15.	Prof Gerhardus Johannes Prinsloo	Director: Technology Transfer and Innovation, Durban University of Technology
16.	Mr Geoff Rothschild	Head: Government and International Affairs, JSE
17.	Ms Nkuli Shinga	Chief Director, Innovation and Technology, <b>Department of Trade and Industry Representative</b>
18.	Prof Jennifer Ann Thomson	Microbiology: Molecular and Cell Biology Department, University of Cape Town
19.	Adv Louisa Barbara Zondo	Human Rights Activist
20.	Ms Kelebogile Dilotsotlhe	

NACI Council 2014-2018 (full list includes resignations over time)		
1.	Prof Cheryl de la Rey <b>NACI Chairperson</b>	Vice-Chancellor, University of Pretoria
2.	Dr Mlungisi Cele <b>Head of NACI</b>	Acting CEO, NACI
3.	Mr Dhesigen Naidoo	CEO: Water Research Commission
4.	Ms Ilse Karg	Acting Chief Dir. Future Production Technologies and Industry, Department of Trade and Industry
5.	Prof Jennifer Ann Thomson	Emeritus Professor, Department of Molecular and Cell Biology, University of Cape Town
6.	Dr Azar Jammie	Director and Chief Economist, Econometrix
7.	Dr Shadrack Moephuli	CEO: Agricultural Research Council
8.	Mr Kevin Nassiep	South African National Energy Development Institute
9.	Garth Strachan	Department of Trade and Industry
10.	Ms Clare Buseti	Executive: SIMODISA
11.	Ms Zanele Monnakgotla	Managing Director: FREE WI
12.	Prof Roseanne Diab	Executive Officer, Academy of Science of South Africa
13.	Prof Glenda Gray	CEO: South African Medical Research Council
14.	Prof Crain Soudien	CEO: Human Sciences Research Council
15.	Dr Molapo Qhobela	CEO: National Research Foundation
16.	Dr Thulani Dlamini	CEO: Council for Scientific and Industrial Research
17.	Mr Paul Steenkamp	I am Jack Frost
18.	Adv Louisa Barbara Zondo	Human Rights Activist
19.	Mr Sullivan O'Carroll	Consumer Goods Council of South Africa
20.	Prof Anton Eberhard	Management Programme in Infrastructure Reform and Regulation, University of Cape Town
21.	Mr Sim Tshabalala (Resigned 18 November 2015)	Standard Bank Group
22.	Ms Nonkululeko Nyembezi-Heita (Resigned 14 April 2016)	IchorCoal N.V.
23.	Dr Sibusiso Sibisi (Resigned 15 August 2016)	CEO: Council for Scientific and Industrial Research
24.	Mr Mafika Mkwanazi (Resigned 29 August 2017)	Hulamin Board
25.	Dr Andile Ngcaba (Resigned 15 August 2017)	Convergence Partners, Dimension Data

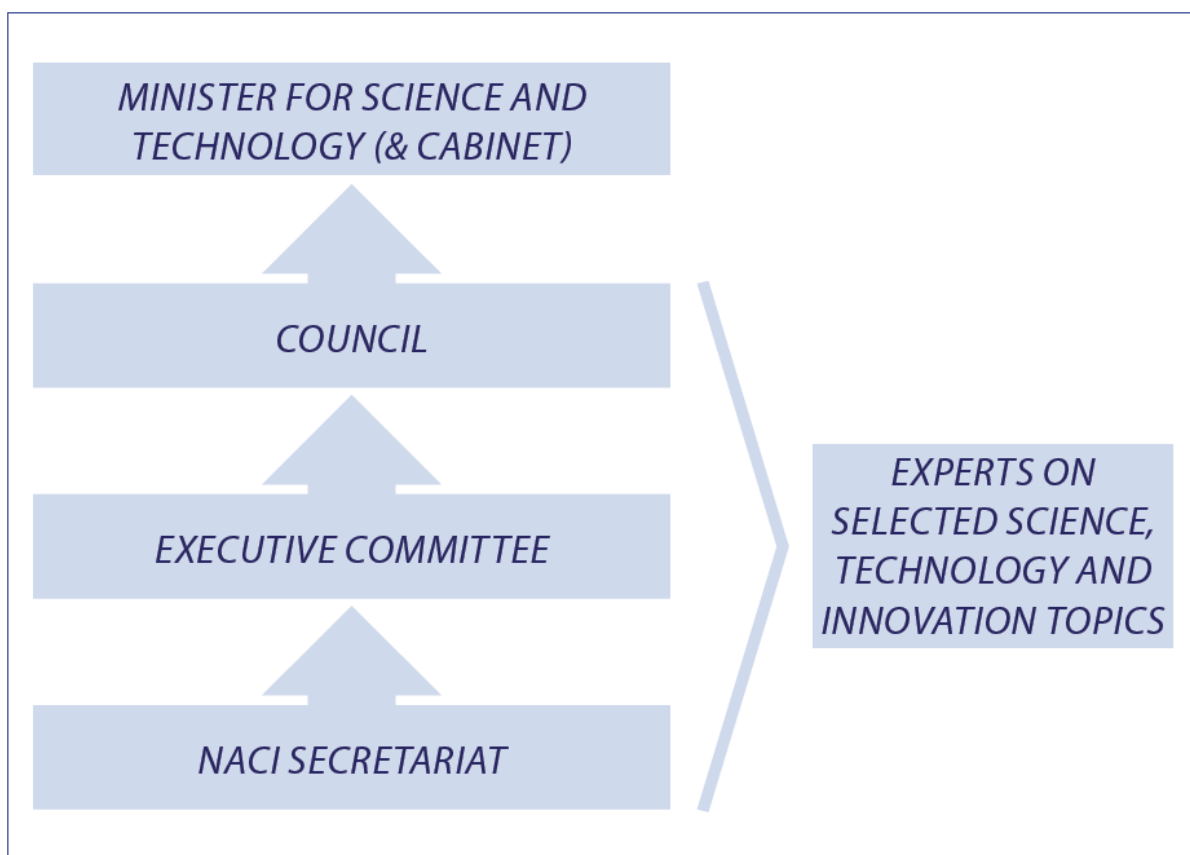
## Appendix 7: NACI Structure, operations and activities

This appendix provides background information about NACI as presented in NACI's corporate and strategic documentation.

**Vision:** A leading advisory body to government on science, technology and innovation (STI) within a well-coordinated, responsive and functioning National System of Innovation (NSI).

**Mission:** To provide evidence-based advice to the Minister of Science and Technology and through the Minister to Cabinet on STI matters through research expertise and engagement with stakeholders.<sup>17</sup>

### Governance and advisory structure



The **NACI Council** consists of a Chairperson appointed by the Minister, the Chief Executive Officer (CEO), an officer of the Department of Trade and Industry (DTI) – appointed by the Minister with the concurrence of the Minister of Trade and Industry, and 16-20 Members appointed by the Minister after consultation with the Minister's Committee, and after submission to the Cabinet for notification.

The members of NACI, other than the CEO and the officer from DTI, are appointed in their personal capacity due to their outstanding achievement in any field of science and technology, or in the context of innovation, special knowledge, experience and insight into the role and contribution of innovation, in promoting and achieving national and provincial objectives.

<sup>17</sup> NACI Strategic Plan 2016-2021

The Chairperson of NACI has direct access to the Minister and members of the Minister’s Committee to submit and discuss any report of NACI, any minutes of a meeting of NACI, or any other matter relating to the functioning of the NSI. The full Council meets four times a year.

The duties of the **Executive Committee (ExCo)** are to dispose of matters determined by the Council. The ExCo’s terms of reference and decision-making power for each matter referred, are decided by the Council. The ExCo meets every month.

The **Secretariat** serves as an operational and management arm of the Council for project management, research and quality advice services.

## Resources

### Staffing

The current NACI Secretariat comprises a full time staff complement of 13 personnel, including a CEO, employed by the Department of Science and Technology. Of the 13 positions 12 are currently filled and one position is in the process of being filled. Of the 13 positions, there is one CEO position and eight specialists. Four of the specialists are at a senior level and four others. The remaining three staff members occupy administrative positions.<sup>18</sup>

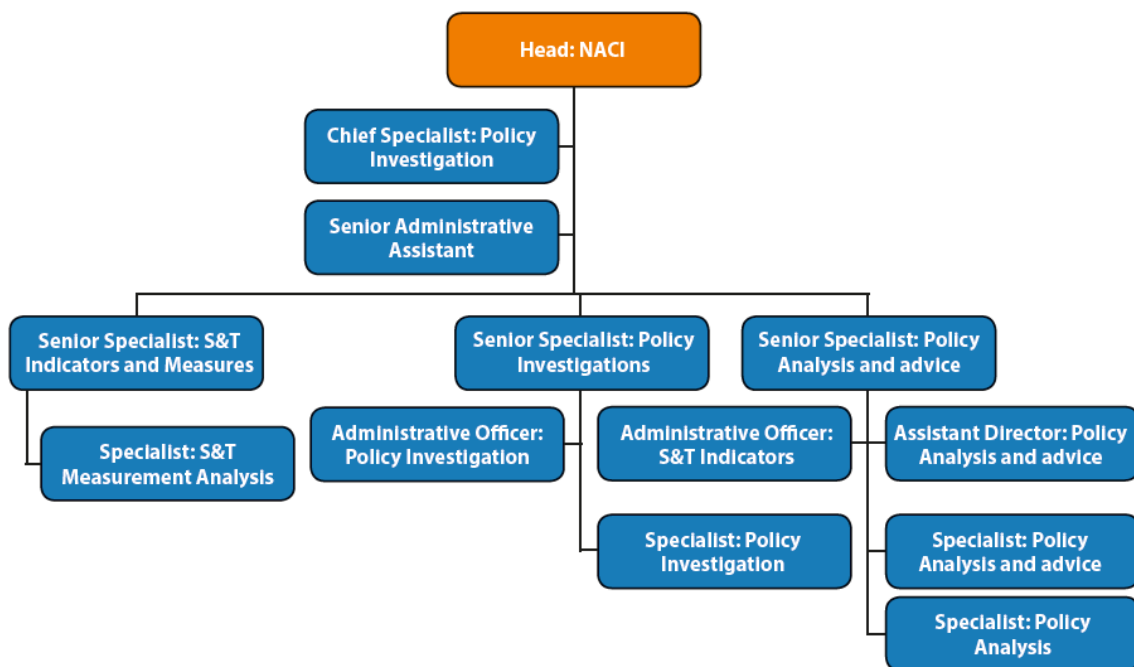


Figure 1 Operational structure of the NACI Secretariat

### Budget

The NACI allocated budget for 2016/17 was R18,8 million, including compensation of employees. The expenditure on goods and services from the annual budget was R8,2 million of which NACI expended R5,7 million resulting in an under-expenditure of R2,4 million. Accumulated savings in respect of goods

<sup>18</sup> Source: Various NACI Corporate documents and NACI website

and services occurred as a result of the development of national STI data and information portal internally.

1 NACI Budgets 2009-2017, source: NACI Annual Reports

Budget year	Allocated budget (R'000)	Expenses (R'000)	Available funds (R'000)	Commitments
2009/10	13 786	13 785		
2010/11	14 922	13 863		
2011/12	14 816	10 830		
2012/13	15 544	11 741	3 804	
2013/14	12 503	11 760	719	22
2014/15	18 257	10 901	6 883	473
2015/16	18 742	12 133	6 609	28
2016/17	18 803	14 249	3 554	

### NACI's current strategic outcome orientated goals

**Goal 1:** To learn from the previous experience to improve efficacy and ensure evidence-based, confidential and timely policy advice to the Minister of Science and Technology and through the Minister of Science and Technology to Cabinet.

**Goal 2:** To contribute to the building of National System of Innovation (NSI) monitoring, evaluation and learning capability in order to assess the health of the NSI and its contribution to sustainable and inclusive development.

**Goal 3:** To contribute to the building of a well-coordinated, responsive and effective NSI by exploring and proposing solutions to the long-standing STI policy questions of coordination, prioritisation, financing, size and shape, human resources, knowledge production and diffusion and so forth.

**Goal 4:** Transforming NACI into a smart, efficient and learning organisation. This goal is intended to address current internal operational inefficiencies, enhance the quality and turn-around time, knowledge management and communication and exploit benefits of digitisation. Skills, knowledge and competency development will be critical.

### The activities of NACI

The following is a summary of the activities of NACI.

#### A high-level framework for a decadal plan on science, technology and innovation

The Minister of Science and Technology requested NACI to review progress since the 1996 White Paper and use the results to craft a new decadal plan. The objective of this project has been to develop a high-level framework for the STI decadal plan. Recent activities include capacity building for about 50 young researchers/policy makers/analysts/planners and a foresight exercise.

[Report on the White Paper on Science and Technology](#)

The objective of this project has been to review the progress of the Department of Science and Technology (DST), and more broadly the Government, towards the implementation of the White Paper on Science and Technology (DACST, 1996). The 1996 White Paper was a seminal document in many respects, acting as a blueprint for the subsequent actions of particularly the DST, formerly the Department of Arts, Culture, Science and Technology, and more broadly the actions of government. However the document is now almost 20 years old and much has happened to necessitate its review within a framework of changes in the policy context, both local and international, and trends in innovation theory.

#### Development of a data and information portal to manage science, technology and innovation information

The aim of this project has been to develop a central repository for establishing research and strategic intelligence, and the production of a biennial state of innovation report. The portal has been successfully launched and recent activities include documenting user experiences and the development of a business case for upscaling the portal. The technical team consists of diverse stakeholders including DST Entities.

#### An innovation scorecard to be a barometer of innovation performance in the economy

NACI is committed to developing the innovation scorecard framework, a key step in producing the planned biannual state of innovation reports.

The activities related to the development of an NSI monitoring and evaluation (M&E) framework and system have involved collaboration with SciSTIP to produce a preliminary draft M&E framework. These activities consider context and will take into account the new White Paper once finalised.

#### Proposed areas of advice

Proposed areas of advice include:

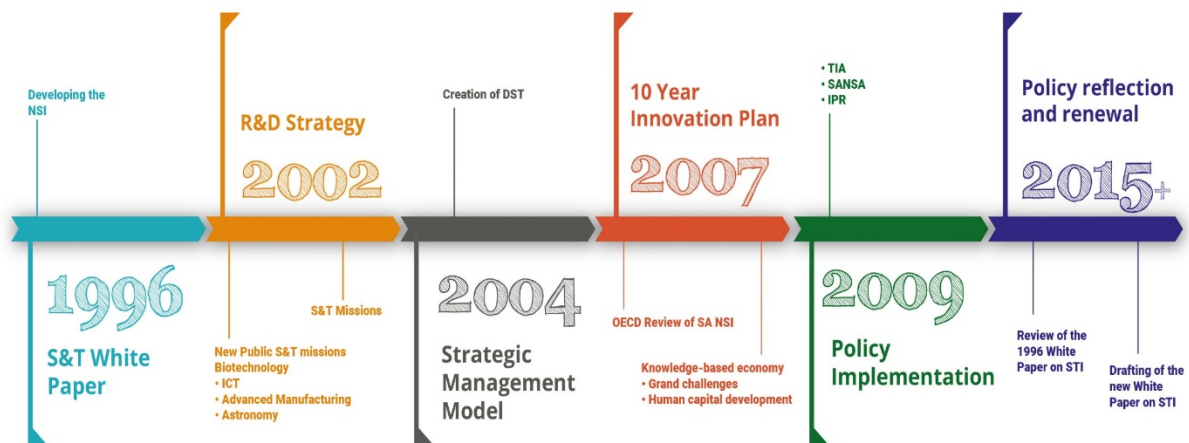
- Uptake of locally produced technologies (collaboration with DST);
- Technology diffusion (including analysis of balance of payments, econometric analysis of the benefits of importing technology);
- Development of bio-economy strategy measurement framework;
- Absorption of black researchers (with masters and doctoral degrees) by firms;
- Evaluation of sector innovation fund (collaboration with DST);
- Grade 12 mathematics and science learner performance; and
- Financing of the NSI (collaboration with Wits Economists, SciSTIP, HSRC).

#### Deepen networks

In order to deepen existing networks, build new networks and participate in local, continental and international forums to learn and share NACI undertakes activities such as:

- Hosting of the BRICS Advisory Forum;
- Working with the SADC STI Desk;
- Strengthening of relations with the NRF, HSRC, DHET, STATsSA, Reserve Bank, CHE, ASSAf, SACNASP, TIA, NEPAD, DST-NRF CoE SciSTIP etc.

## Appendix 8: The trajectory of NACI: 2009-2017



Since this 2018 NACI Institutional Review covers a nine-year period, from 2009 to 2017, it is important to consider the changes that have occurred over time.

One of the significant institutional initiatives of South Africa’s 1996 White Paper on Science and Technology, “*Preparing for the 21<sup>st</sup> Century*”, was the creation of NACI. The policy was subsequently implemented by the passage of the National Council on Innovation Act of 1997. It could be mentioned that this makes NACI one of the more experienced Councils internationally. The first appointments to the Council were made in October 1998. Throughout the official documentation there is consistent and clear expression of the role of NACI as an advisor to government on all issues relating to national policy and its implementation relating to the functioning of the national system of innovation (NSI). This role is both broad – in that it mandates the provision of advice to all of government – and narrow in that NACI is designed to perform only an advisory role and has neither decision-making nor implementation functions. It also means NACI has no real coordination function.

Here is a high-level, chronological overview of the trajectory of the organisation with particular emphasis on the period under review – 2009 to 2017.

### 2003 First NACI Institutional Review released

In October 2002 NACI’s performance was reviewed for the first time. The “*Audit of the Performance of South Africa’s National Advisory Council on Innovation*” reviewed the period 1998-2002 and was released in 2003.

### 2007 OECD Review

DST commissioned the Organisation for Economic Cooperation and Development (OECD) to conduct a review of South Africa’s innovation policy (effectively the NSI and related policies). Published in 2007, the OECD Review constituted one of a series of highly regarded OECD country reviews of innovation policy conducted according to a well-developed methodology. The experts concluded that:

- NSI insufficiently supported transition from resource/commodity economy to value-adding and knowledge-intensive activities;
- Limited horizontal coherence and integration between agencies in the NSI, and no Cabinet-level coordinating body to devise and monitor national strategies for innovation, and marshalling of the resources needed;



- NACI's mandate hamstrung by the fact that it reported to the DST and thus had no structural location that would afford it the authority needed for effective coordination of a national system;
- Business at all levels insufficiently involved in building the NSI;
- Concept of an NSI yet to gain sufficient currency;
- Notion of innovation – including technical, economic and social – poorly understood;
- Functioning of NSI seriously impeded by deficit in high-order skills;
- Institutionalisation of STI measurement capacity inadequate;
- NSI making inadequate contribution to poverty reduction and wider inclusion in the mainstream economy;
- Levels of innovation required in the economy would only be possible if there was a considerable expansion of university research;
- SA would need to compete for high-end skills in the global talent pool where advanced economies were implementing immigration measures to attract high-level scientific and technological competencies (not least from South Africa).

Shortly thereafter, the DST's Ten-Year Innovation Plan (TYIP) was released, but some of the most central recommendations of the OECD Review were not addressed in the plan. The DST did however provide a measured response to the OECD's recommendations in its 2012 Ministerial Review (see below).

#### 2008 NACI Institutional Review

The major recommendation to emerge from this second Institutional Review revolved around a call to address the issue of reporting relationships, particularly to ensure that NACI reaches its full potential. The text reads:

*“Two issues need to be addressed to ensure that NACI reaches its full potential as the policy advisory body to government on innovation. The first relates to the level and breadth at which NACI reports to government to ensure that it is taken seriously and that the right level of coordination is ensured, while the second relates to the administrative arrangements in place to ensure its independence and ability to resource the right people, both for the Council and the Secretariat.”*

This report argued that for NACI to meet its mandate government could consider two options, with the 2008 panel's preference being the second option.

**Option 1:** *NACI stays in the DST, but a number of important changes are implemented. These include that the CEO/Head of Secretariat reports directly to the Minister and that the position is elevated to be similar in level to that of the heads of science councils. The budget would still reside in the DST, but in the form of a single line item, and the DST would continue to provide administrative support functions. The Council and CEO of the Secretariat would be fully responsible for NACI, including managing the finances and affairs according to the PFMA (in other words, DST would not have an oversight role with respect of NACI at all).*

**Option 2:** *To optimally solve the issues identified, we propose the formation of a Ministers' Council on Innovation (MCI). We propose that this Council be appointed and chaired by the President, with the Minister of Science and Technology serving as Deputy Chair of the Council and playing a leading role of coordination, in keeping with his present role of coordination in the NSI. The other members of the MCI would be key Ministers in the innovation space, such*

*as the Ministers of Trade and Industry, Education, Health, Communication, Public Works, Public Enterprises and National Treasury. The Chairperson of the NACI Council and CEO/Head of the NACI Secretariat would advise the MCI on the deliberation and advice from NACI.”*

The review recommended that the size of the NACI Council be reduced – from 22 as per the Act – to between 12 and 16 members, of a similar mix, but with greater emphasis on trying to involve the CEOs of leading companies.

For the purpose of administrative services, the panel proposed that NACI still reside close to the DST, but (as in Option 1), that the NACI budget would be a one-liner in DST appropriation, with full budget control residing in NACI itself. In addition, it was proposed that the potential be created for other ministries to invest financial and human resources in NACI for broader studies.

NACI produced a response to the Review in October 2008. Regarding the issue of reporting relationships, NACI stated:

*“NACI considered various options to maximise its influence and reach. It is acknowledged that innovation is a cross departmental priority, as (to a greater or lesser extent) are most other priorities or responsibilities of government. NACI will therefore aim to optimally interact with relevant existing government structures and raise its influence by improving the relevance of its advice to the broader range of government stakeholders.*

*According to the NACI Act, NACI shall advise the Minister, and through the Minister, the Ministers Committee and the Cabinet on issues relating to innovation. The Minister’s Committee has not been in existence for most of the ten years of NACI’s operations, as it was replaced by the Cabinet cluster system. We therefore propose that NACI advise the Minister, and, in consultation with the Minister, advise Cabinet collectively or any other Minister individually. As in the past, we propose that the Chairperson of NACI has direct access to the Minister and other members of the Cabinet through the Minister to submit and discuss any report of NACI, any minutes of a meeting of NACI or any other matter relating to the functioning of NACI.”*

Regarding the appointment of members, NACI recommended that its members be appointed by the President, and not by the Minister of S&T, and that in doing so, the President consult with Cabinet, through the Minister of S&T.

#### 2009-2011 Priorities and changes

Following the 2008 Review the NACI Council, then led by Chairperson Dr Steve Lennon of Eskom, appointed Prof Krish Baruth-Ram as head of the Secretariat and oversaw the move of NACI out of the DST building and into its own offices.

The focus during this period was on:

- Raising the profile of NACI and broadening its scope beyond the technological aspects of its mandate;
- Relooking reporting lines (with respect to the way in which its advice and reports are presented to government, as well as its relationship with policy advisory units at South African universities and abroad);
- Establishing an Innovation for Development Committee; and
- Introducing some structural changes, including restructuring of the Secretariat to provide for several in-house experts, as well as strong links with university research units and science

councils, thereby equipping the Secretariat with the strong analytical and policy advice capability required to formulate clear evidence-based recommendations to government.

NACI began to revise its strategic objectives and to introduce a new way of working. This entailed a move away from permanent standing committees towards the introduction of project task teams comprising experts drawn from universities, science councils and business. It also began to enhance its in-house research and policy-analysis capacity.

### 2012 Ministerial Review

Professor Loyiso Nongxa chaired the Ministerial Review Committee on the NSI that produced the *Ministerial Review Committee Report* released in March 2012. The Committee called for a full-spectrum, fully national system of innovation that reaches into all productive activities contributing to livelihoods in all sectors of society and added that:

*“What is needed more than ever is a high-level expert body that will offer guidance to the NSI as a whole, a role that neither the defunct Ministers’ Committee on Science and Technology nor NACI has been able to fulfil.”*

The Committee commented on the role and positioning of NACI and other institutions, and the need for possible new state agencies. The Committee acknowledged that its two core recommendations – to introduce a high-level coordinating body and to reform NACI – have previously appeared in one form or another, yet had failed to gain traction.

**One of its recommendations was the inception of a compact statutory National Council on Research and Innovation (NCRI)** to carry out the task of prioritisation and agenda-setting for the NSI, oversight of the system and high-level monitoring of its evolution, outcomes and developmental impact. The Ministerial Review Committee was of the opinion that failure to establish such a high-level steering mechanism for the NSI would mean no coherent strategy and no real progress for many years to come.

*“The 2008 review of NACI pointed out the urgent need for the creation of such a body; NACI itself, as currently constituted, is not equipped to perform its proposed roles.”*

The report concluded that in order to create an impactful NSI, innovation must be seen as going beyond R&D for it to be pervasive and permeate public service delivery systems. It stated that the State’s investment in innovation was historically skewed towards supply-side measures such as big science, as opposed to demand-side measures such as creating an enabling environment for business and social development priorities.

The Ministerial Review’s key findings in respect of NACI were that NACI’s mandate was hamstrung by the fact that it reported to the DST and thus had no structural location that would afford it the authority needed for effective co-ordination of the NSI. The report concluded that NACI had been effectively constrained to “advise” only in the limited NSI domains in which the DST can operate and that in order for NACI to be effective, it needed a strong, efficient and effective Secretariat with substantial professional, technical and analytical capability (beyond mere administrative competence).

### 2012 NACI and DST respond

The challenges outlined in the Ministerial Review were taken up at workshops of NACI Council and the Secretariat, and resulted in the development of a revised NACI Strategic Plan in which the key objectives were:

- To play a lead role in working towards achieving coherence and co-ordination in the NSI through the development of a National Innovation Framework which would include Regional Innovation Specialisation at government departmental level, as well as at regional and local levels;
- To monitor and evaluate the strength of, and foster alignment within, the NSI;
- To monitor and advise on the contribution of innovation to South Africa's economic growth and competitiveness, and to improve the quality of life of its citizens; and
- It would emphasise the development of the professional, technical and analytical skills of the Secretariat.

NACI met with a selection of research and innovation experts who agreed to form a NACI task team to work towards the development of a National Innovation Framework, including regional innovation strategies and the clarification of roles between various agencies in order to achieve coherence and co-ordination in the NSI.

NACI planned a national symposium with international and national participation as well as brainstorming sessions to address the above issues and inform priority objectives.

The organisation transitioned away from the committee and reference group approach and adopted a project team approach to conducting business. Council would set the goals, terms of reference, and measurable outcomes for the project teams. The project teams would consist of individuals with the expertise necessary to complete the project, and the roles of each selected team member would be clearly defined, thereby assuring timely delivery of high quality reports and other outcomes. The new operational model utilised project teams through joint appointments from higher education institutions and science councils, as well as the expansion of in-house Secretariat research abilities to reduce its reliance on service providers.

The above actions would enable NACI to more readily respond to a rapidly changing innovation environment, be more responsive to the changing political environment and evolve into a policy development body on research development and innovation.

The Minister responded favourably to the Ministerial Review Committee's recommendations with regard to NACI by, inter alia, **statutorily providing for a CEO position, appointing high-level business representation on Council and acknowledging its coordinating role in the NSI.** In addition, terms of reference were developed to define the relationship between NACI and government. The preceding developments better empowered NACI to effectively fulfil its mission.

Moving forward, NACI would focus on partnerships with relevant stakeholders, in particular the business sector, to leverage on and seek policy support for existing local innovations and for replicable international models.

### 2014 New leadership

At the conclusion of Dr Steve Lennon's second term as Chairperson, the NACI Council aligned itself with the National Development Plan – Vision 2030 (NDP)<sup>19</sup>. Council presented an Innovation Framework for the system as a whole. This new framework was designed to enable alignment across all stakeholders in the NSI with a view to achieving truly sustainable development for the South African economy. Innovation was embedded in the performance of the entire economic system, which in turn had to be fully integrated with the NSI.

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<sup>19</sup> <https://www.gov.za/documents/national-development-plan-2030-our-future-make-it-work>

This period also saw the establishment of the NACI CEO role which set the scene for a NACI that is more independent of the Department while still fostering a strong implementation partnership with the DST and other government departments.

Plans for the innovation portal were put in motion and NACI defined itself as the custodian of system wide data strategy and interpretation, coupled with a stronger role in advising across government, through the Minister of S&T to reinforce NACI's role as a brains trust for the system.

During the inauguration of the new Council in September 2014, then Minister of Science and Technology Ms Naledi Pandor highlighted three priorities for NACI.

*First, NACI is to undertake a review of the 1996 White Paper on Science and Technology, in order to inform preparations for the development of a new White Paper on STI.*

*Second, NACI was tasked with preparing for the development of a decadal plan on STI to guide the trajectory of the country's NSI, and will be reviewed in midterm to ensure that promising research and innovation opportunities continue to be uncovered during the period of the Plan.*

*The Minister recommended the addition of foresight studies to the work of NACI. Specifically,*

*“NACI could assist in identifying policy gaps and areas of scientific and technological activity that we need to add to the work of our research community. Furthermore foresight studies would also advise government on new institutional forms or modifications that need to be made to ensure we are system ready for new discipline focus areas”.*

*Third, NACI was tasked with the development of the innovation portal framework to serve as a central repository for improved accumulation, analysis and utilisation of the plethora of information on science, technology and innovation that is currently produced and hosted by different publicly-funded agencies.*

## 2015 Council lays out its plans

In 2015 Dr Mlungisi Cele was appointed acting CEO to lead the organisation, a position that he still occupies. The new Council took the NDP and the MTSF as its points of departure in developing its 2015-2020 Strategic Plan. The nine key challenges identified by the National Planning Commission in its Diagnostic Report (2011) were considered.<sup>20</sup> In the Strategic Plan, NACI also states that since its strategic priorities cut across the mandates of several government departments, it is the organisation's intention to engage all stakeholders extensively on priority issues in order to arrive at inclusive and comprehensive policy solutions, and cohesive strategies, **hinting at a much broader conception of innovation.**

## 2018 and beyond: Adapting to global transformation, the Fourth Industrial Revolution, Industry 4.0 and Society 5.0

STI can play a critical role in addressing economic and social challenges (including education, food security, and health). This is recognised by the NDP, which notes that developments in STI fundamentally alter the way people live, communicate and transact, with profound effects on economic growth and development. The NDP further indicates that countries that are able to tackle poverty effectively by growing their economies are characterised by strong STI.

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<sup>20</sup> NACI Annual Report 2014/2015

The NACI 2016-2021 Strategic Plan articulates a vision and identifies strategic-outcome oriented goals that seek to contribute to the realisation of the NDP vision and the mandate of NACI.

NACI's 2018/2019 Strategic Outcome-Oriented Goals:

- To learn from previous experience to improve efficacy, relevance and ensure evidence-based, confidential and timely STI advice to the Minister of Science and Technology and, through the Minister, Cabinet.
- To contribute to the building of NSI monitoring, evaluation and learning (MEL) capability in order to assess the health of the NSI and its contribution to sustainable and inclusive development.
- To contribute to the building of a well-coordinated, responsive and effective NSI.
- Transforming NACI into a smart, efficient and learning organisation (See Figure 2 below).

NACI intends to strengthen its capacity to store and analyse data and improve the quality, relevance and efficacy of its advice, which must be evidence based. It also seeks to strengthen its ability to conduct system's planning, monitoring and evaluation in order to bolster policy performance. Recognising that the NSI remains a work in progress, NACI intends to contribute to the development of an NSI that is coherent, coordinated and responsive to national priorities. Local and international networks and partnerships will play an important role in ensuring successful implementation of NACI's Strategic Plan.<sup>21</sup>

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<sup>21</sup> NACI Strategic Plan 2016-2021

Ideal National System of Innovation (source: NACI Annual Performance Plan 2018)

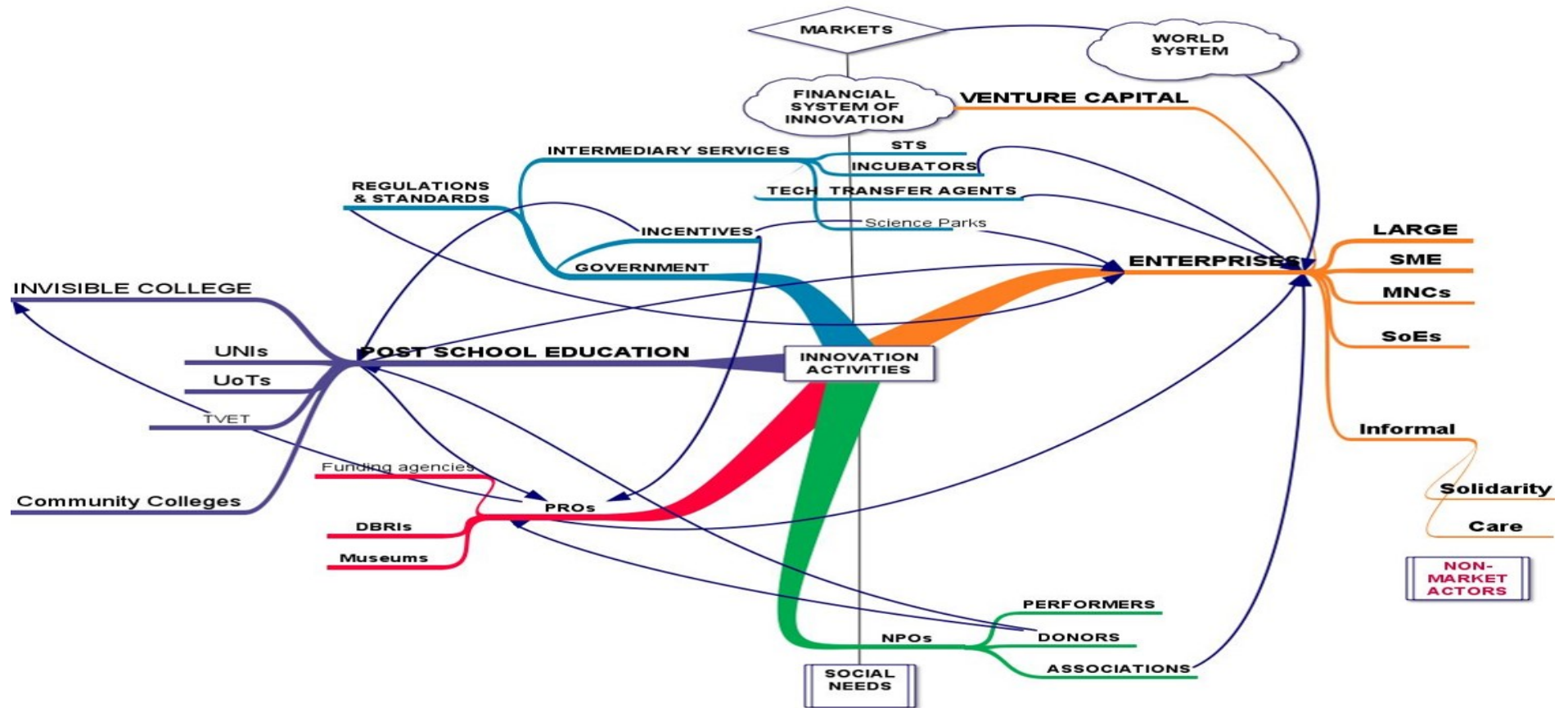


Figure 2 Ideal National System of Innovation as per NACI Annual Performance Plan 2018



## Appendix 9: Comparative analysis of a selection of innovation councils

There is a general lack of comparative analysis of innovation councils – and, in particular, on their role and impact as an instrument of innovation governance. However, an overview of 14 national research and innovation councils published by the Swedish Governmental Agency for Innovation Systems, VINNOVA, in 2015<sup>22</sup> shows that a national council’s influence or impact is not only determined by its mandate or its composition – i.e. the extent to which the council is composed of high-level decision makers as opposed to ‘merely’ experts in their own right. Rather, there are many factors – acting in combination with one another – that contribute to a councils’ impact on innovation policy. These include:

- A mandate, composition and anchoring at top political level to give legitimacy;
- A focus that is relevant and anchored in the national context – taking a broad perspective on innovation and a systemic approach;
- A mandate, governmental anchoring and composition that fosters receptiveness and willingness on behalf of government to receive and act upon advice;
- A focus/approach and composition which acknowledges the increasing internationalisation of research and innovation to avoid the council (and innovation policy) becoming inward-looking; and
- Resources (budget and staff) that allow the council to produce and/or commission relevant analysis and work with forward-looking activities.

Research and innovation councils (briefly referred to as “innovation councils” in this Appendix) have become widely used as a “strategic intelligence” or governance tool by countries around the world, as shown in a number of OECD Reviews of Innovation Policy.<sup>23</sup> Recent work under the OECD Working Party on Innovation and Technology Policy (TIP)<sup>24</sup> finds that in 2017, 31 out of 35 OECD countries had such a council (Table 1).<sup>25</sup> Moreover, the number of countries operating an innovation council has expanded rapidly. No less than 15 countries have established their current innovation council after 2010, i.e. their number has doubled within less than a decade. Some countries (for instance Germany) operate several councils focusing on different tasks or covering specific parts of or functions in the research and innovation system. There are only few OECD countries today that do not have a council. These are Ireland, Italy, New Zealand and Norway. However, Ireland and New Zealand have a Chief Scientific Adviser in the Anglo-Saxon tradition, while Norway’s government is following a pronounced

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<sup>22</sup> Schwaag Serger, S., Wise, E., Arnold, E. (2015), *National Research and Innovation Councils as an Instrument of Innovation Governance*, Vinnova Analysis, VA 2915:07, Stockholm,

[https://www.vinnova.se/contentassets/4da13cc174a448d1a3f0b816c6b74366/va\\_15\\_07t.pdf](https://www.vinnova.se/contentassets/4da13cc174a448d1a3f0b816c6b74366/va_15_07t.pdf) .

This work extends and updates a first international comparative analysis presented in OECD (2009), *Chile’s National Innovation Council for Competitiveness. Interim Assessment and Outlook*, available on the World Bank / OECD Innovation Policy Platform (IPP)

[https://www.innovationpolicyplatform.org/sites/default/files/OECD%20Interim%20Assessment%20and%20Outlook%20-%20Chile%20NICC%202009%20\\_0.pdf](https://www.innovationpolicyplatform.org/sites/default/files/OECD%20Interim%20Assessment%20and%20Outlook%20-%20Chile%20NICC%202009%20_0.pdf). This analysis was a sequel to OECD (2007b), *OECD Review of Innovation Policy: Chile*, OECD Publishers, Paris

<sup>23</sup> E.g. OECD (2007a), *OECD Review of Innovation Policy: South Africa*, OECD Publishers, Paris. For a recent example see OECD (2017a), *OECD Review of Innovation Policy: Finland 2017*, OECD Publishers, Paris

<sup>24</sup> OECD (2018), *How is Research Policy Across the OECD Organised?*, forthcoming

<sup>25</sup> For the purposes of this work, this type of councils are defined as non-temporary public bodies outside of ministries and agencies that have explicit mandates to engage in one or several of the following activities: provide policy advice or oversee policy evaluation, co-ordinate policy areas relative to public research, set policy priorities and/or engage in joint policy planning regarding higher education institutions and public research institutes



“sector principle” with strong line ministries. With relatively little structured coordination at ministry level, coordination functions are partly delegated to the agency level, notably to the Research Council of Norway (RCN), a comprehensive funding agency for research and innovation used across ministries.<sup>26</sup> Additional information can be obtained through the new STIP Compass.<sup>27</sup>

Nearly all councils (90%) identified in the OECD area offer advisory functions, and three quarters contribute in some way to strategic priority setting. Approximately one half of the councils engage in policy evaluation and policy coordination, respectively. In contrast, decisions on budgetary allocations are only taken by one quarter of the councils. Operational co-ordination of STI institutions and policies (as distinct from providing analysis and expert advice on policy coordination) typically requires a strong political mandate and involvement of the political level. The budgetary function has to be handled with caution and may also have implications on the composition in order to avoid perceptions of conflict of interest at the council itself becoming part for a struggle for resources. This may, in some cases, tarnish its image of impartiality which is an important asset for its credibility in other functions (such as giving advice).

OECD (2009) emphasised that the role and structure of councils represents a choice by government. The study concluded that the councils reviewed at the time provided three possible choices:

- 1) *A joint planning model* (Japan), where the government uses the council as a virtual “horizontal ministry of innovation”, much as engineering companies build project teams by bringing together people across different disciplines.
- 2) *A co-ordination model* (Chile, Finland, Netherlands, to some extent Austria), where the intention is that the council should communicate horizontally across ministry responsibilities so as to align policies in support of innovation, without this alignment always being binding.
- 3) *An advice model* (Canada, Ireland, the Netherlands’ AWT, Switzerland, UK), where the council proactively or reactively advises government on research and innovation policy but this advice is not binding.

Schwaag Serger, Wise and Arnold (2015) found this categorisation still useful but suggested to add:

- 4) *A “platform for inter-action” model*, where the council lacks a clear mandate or substantial resources, e.g. to plan and coordinate policy but functions more as a “sounding board”.

The planning and co-ordination models require significant commitments of ministers’ time as well as willingness across the political and institutional spectre to see research and innovation as permanently central aspects of government policy (OECD, 2009). As mentioned, the anchoring of councils in government differs widely. In both the planning and the co-ordination models, ministers typically are members of the council (in some cases, like Austria and Chile, as non-voting members). NACI belongs to the third category of councils. In contrast to current practice of NACI, however, councils in many countries effectively provide analysis and advice across government ministries or to other state institutions, including parliament, regional governments etc.

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<sup>26</sup> OECD (2017b), *OECD Review of Innovation Policy: Norway 2017*, OECD Publishers, Paris

<sup>27</sup> The OECD STIP Compass – <https://stip.oecd.org/stip.html> – is an initiative of the European Commission and the OECD. The portal provides a sophisticated search tool that facilitates policy discovery, allowing users to query the database on policies of about 50 countries (including South Africa) on a wide range of STI policy issues.

Table 1. Mandates of the research and innovation councils

	CZE	HUN	JPN	MEX	DEU <sup>1</sup>			GBR	ISR	KOR	LVA	POL	TUR	BEL <sup>2</sup>			CHL	FIN <sup>3</sup>	LUX <sup>4</sup>	SVN	SVK	AUT	CHE	ESP <sup>5</sup>	EST	FRA	GRC	ISL	USA	AUS	CAN	DNK	NLD	PRT <sup>6</sup>		SWE	Share of countries with Councils (%)
					Innovation Dialogue Council of Science and Humanities	Expert Commission for Research and Innovation								BEL-FED	BEL-BC	BEL-FL	BEL-WA	Old council (86-'16)	New council (since '16)														National Council for Science and Technology	National Council for Entrepreneurship and Innovation			
Policy advice	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	90% 28 of 31	
Strategic priority setting	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	74% 23 of 31
Policy evaluation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	48% 15 of 31	
Policy coordination	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	48% 15 of 31	
Decision on budget allocations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	23% 7 of 31	

Note: This figure corresponds to the following questions: “Does the Research and Innovation Council’s mandate explicitly include: a) Policy coordination, b) Preparation of strategic priorities, c) Decision-making on budgetary allocations, d) Evaluation of policies’ implementation (including their enforcement), e) Provision of policy advice?”. There is no Council in Ireland, Italy, Norway and New Zealand. Percentages are expressed as a share of the countries with a council in place (N=31).

<sup>1</sup> Germany has three main Councils: The Council of Science and Humanities, the Expert Commission for Research and Innovation and the Innovation Dialogue. Information for all three councils was used for the cross-country comparison. All three councils' mandates include policy coordination and provision of policy advice. The mandates of the Council of Science and Humanities and the Expert Commission for Research and Innovation also include development of strategic priorities and policy evaluation.

<sup>2</sup> Belgium has a Council for the Brussels-Capital Region (Council of Science Policy), a Council for the Flemish Community (Flemish Council for Science and Innovation) and a Council for the Walloon Region (Science Policy Pole) and a Federal Council (Federal Science Policy Council).

<sup>3</sup> The Finnish Research and Innovation Council had been dissolved in 2016 and a new Council was established under the same name in the same year. Due to changes to the composition and mandate of the Council this analysis treats them as two separate entities.

<sup>4</sup> In Luxembourg, the Superior Committee for Research and Innovation has not convened since 2014.

<sup>5</sup> Spain’s Council for Scientific, Technological and Innovation Policies is responsible for the coordination of national and regional science, technology and innovation policies. Policy Advice is provided by a dedicated Advisory Council.

<sup>6</sup> Portugal has two main councils: The National Council for Science and Technology, and the National Council for Entrepreneurship and Innovation. They have not convened since 2015.

Source: OECD (2018), *How is Research Policy Across the OECD Organised?*, forthcoming.

### Example: Finland’s Research and Innovation Council (RIC)

An emblematic council that has served as a reference for numerous such councils across the world has been the Finnish RIC that has been in operation since 1986 (initially as Finnish Science and Technology Policy Council). The RIC has changed its role over time. However, it has been much more than an advisory council but had important functions priority setting in STI policy and coordination. Chaired by the Prime Minister, the Ministers of the Economy and the Minister of Higher Education, and a limited number of other Ministers, the council gathered experts representing expertise in research and innovation. The Finnish RIC has inspired policymakers in countries at widely different levels of income per capita and scientific and technological capabilities. The attractiveness of the Finnish council was due to its perceived role as a highly successful process, punctuated by recessions, of catching up and structural transformation of Finland into one of the leading knowledge-based, high-technology goods exporting economy, with Nokia at the core of the electronics industry. In the aftermath of the global financial crisis of 2008, however, Finland’s economy was hit hard, Nokia and the Finnish electronics sector suffered from the effects of disruptive technological change symbolised by the introduction of the iPhone (also in 2008) (exacerbated by structural problems affecting the opposite side of the Finnish economy’s specialisation, in particular traditional paper products facing a technology-induced decline in demand) has also dealt a severe blow to the STI governance system. In this situation, the policy the famous RIC itself stopped operation for a period of time during the crisis, and was re-established in different form and apparently with a lesser role overall in the Finnish innovation system in 2016.<sup>28</sup>

Over time, demands on research and innovation councils have evolved and continue to change substantially:

- While initially their scope tended to be limited to issues of science and technology policy in a narrow sense, their remit has been progressively extended to “innovation” in a wider sense (including non-technical innovation). This trend has changed the characteristics and activities of the councils substantially. Councils have, in many cases, changed their names to reflect this development.
- Theoretical and empirical work on innovation systems, innovation processes and innovative networks and clusters have underpinned this wider approach of innovation councils. “Whole-of-government” approaches calling for a coordination of policies across different policy areas (and hence organisational borders such as those of line ministries) seemed to be particularly well suited to innovation policy that involves many policy areas.<sup>29</sup> New perspectives on reform processes – in particular on increasing efficacy by combining reforms in various areas and adequately sequencing action – have also been drivers of change.
- The increasing need to tackle societal challenges and other broad-based transitions (such as digitalisation) reinforce the need for cross-cutting integrative approaches and to involve a broader set of actors. Inevitably, there are tensions arise between new demands on the one hand, and, on the other hand, the compartmentalised manner governments often work in practice. Tensions also arise between the level of existing capacities and the informational and analytical capabilities to fulfil council’s demanding tasks in a satisfactory manner.

The **composition** of a council should be aligned to its mandate which in the end means the function it is supposed to fulfil in the national system of innovation. Many innovation councils have a **secretariat**, but the size of these units varies. Moreover, secretariat staff may be own staff or staff provided other

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<sup>28</sup> OECD (2017a), OECD Review of Innovation Policy: Finland 2017, OECD Publishers, Paris

<sup>29</sup> OECD (2013), The Innovation Imperative, OECD Publishers, Paris

institutions. A secretariat with own staff sends a strong signal of independence. To be able to fulfil its role, a council's secretariat will have to have the "absorptive capacities" to effectively monitor ongoing national and international work on STI indicator developments, assess and interpret analysis of STI and translate and apply this work to the national policy context. The scope of its task varies with its mandate, reflecting the council's role in the national system of innovation. The three scenarios outlined in this Review imply different requirements of secretariat staff numbers and qualifications.

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