Mid-term evaluation of the Swedish National Incubator Programme (NIP) (Sweden)

1. Introduction

This case study looks at the commissioning, implementation and lessons learned from the 2008 Mid-term Evaluation of the Swedish National Incubator Programme (NIP).[1]

The evaluation was commissioned by VINNOVA – the Swedish Governmental Agency for Innovation Systems – and concerned an innovation-support measure that was launched by VINNOVA and later taken over by the (then) newly established agency Innovationsbron. Innovationsbron is another Swedish innovation agency in the form of a state owned company, with the task of aiding the commercialisation of research and innovation in Sweden.

An International Expert Panel carried out the evaluation for VINNOVA and Innovationsbron, supported by a dedicated secretariat. The panel comprised four non-national experts each of whom is renowned for his or her work in the creation and management of networks of incubators, with their insight and analytical contributions anchored in a substantive programme of data collection carried out by a secretariat appointed for the duration of the review. The work of the secretariat was commissioned from Inno Germany AG, an international consultancy group with expertise both in carrying out policy evaluations and in managing incubators.

The Expert Panel bore overall responsibility for the study, driving the evaluation process and taking the lead in formulating the conclusions and recommendations. The final report however was compiled by the secretariat on behalf of the experts.

The evaluation aimed at finding out how the programme implementation was proceeding. The study objectives were twofold, namely to 1) identify and understand the effects of the programme so far, and 2) develop recommendations to feed into the second half of the programme period. In carrying out its work, the Panel focused on:

- Basic outcomes of the National Incubator Programme (NIP) from an international perspective (e.g. the economic development of the incubators);
- The NIP as an intervention (e.g. the role of NIP in the Swedish innovation system, its design and implementation).

Figure 1 summarises the Panel's conclusions about the NIP, set out in full in the English-language evaluation report, which can be downloaded from the VINNOVA website[2].

Figure 1 Summary – NIP strengths and weaknesses according to the Expert Panel

"The overall feedback from the Panel on the basis of past achievements (Phases 1 & 2) is that the NIP is gathering momentum; it is worth continuing and developing along the current lines.

The particular strengths of the National Incubator Programme (NIP) so far (Phases 1&2) include:

- Networking and exchange of experience among incubator managers, which helps developing

[1] This particular case study is based on desk research to a great extent, as each of the main protagonists had either moved to new jobs and could not be reached (e.g. the members of the expert panel and the evaluation customer) or, in the case of the secretariat, declined to give an interview. Nevertheless, the case study has benefited from interviews with key figures in VINNOVA. The individuals consulted are listed at the end of this case study.

[2] www.vinnova.se/en/Publications/Products/Mid-term-evaluation-of-the-Swedish-National-Incubator-Programme/

incubator manager skills

- Networking among local and regional actors including both government and universities
- Concentration on providing good coaching and mentoring for the enterprises
- Flexibility to allow different business models to emerge and develop
- Growth towards a critical mass of new incubators joining in the network.

At an innovation system level, the Panel notes that some areas of the Swedish innovation system that influence the success of an incubation programme appear to be less well developed about:

- Clarity on the issues of intellectual property rights (teacher exemption), which impacts on many aspects and notably on investors
- Thematic issues such as specialist facilities and resources for chosen sectors [for example additional support for commercial initiatives within life sciences and ICT, both important incubator sectors in Sweden]
- A well integrated financial system for investment in new enterprises from business angels to private and public equity
- A research institution sector to serve industry such as e.g. those of the UK and Germany".

When Innovationsbron launched a successor to NIP known as Business Incubation for Growth Sweden (BIG) in 2010, its design drew heavily on the lessons learned from various studies and consultations that were conducted during the life of the NIP. These studies include this particular mid-term evaluation as well as an international benchmarking exercise conducted by Innovationsbron.

2. Description of the evaluated measure

The National Incubator Programme was launched in 2003 with the aim of increasing the number of new Swedish R&D intensive growth companies. "The [long-term] vision of the programme [was] that incubators should be developed, managed, and located so that they become world-class forums where commercial demands and complementary cutting-edge competence can meet and interplay with leading researchers, innovators, investors and entrepreneurs"[3].

The programme design was largely modelled on a long-established Israeli initiative, but adapted to national circumstances in order to accommodate experiences gained from previous Swedish technology parks programmes.

Figure 2 Timeline of the Swedish National Incubator Programme

Autumn 2002	The Swedish Government approved a budget of €3m to VINNOVA for a pilot programme on incubation.
February 2003	The first call for proposal was published.
June 2003	The pilot programme (NIP1) started with 14 incubators. After the first year, the programme was extended for further six month and additional €1.5m taken from VINNOVA's budget.
Autumn 2004	Innovationsbron was formed. VINNOVAs 10-year commitment to fund the NIP with €5m per year constituted Government investment and holding in Innovationsbron AB. The call for NIP2 was published
January 2005	Start of the NIP2 with 12 full participant and 6 associated incubators for a period of 18 months.

[3] ERA-Watch Sweden country report

March 2005	The responsibility for the implementation and management of the NIP2 was transferred from VINNOVA to Innovationsbron.
Summer 2006	The NIP2 was extended for one year.
Summer 2007	The NIP2 was further extended. The Call for NIP3 was rescheduled for spring 2008.

Source: Adapted from Inno Germany AG *Mid-term Evaluation of the Swedish National Incubator Programme Final report*, Karlsruhe, June 2008.

Sweden's innovation system as a whole is characterised by the (long-term) lack of private pre-commercial Venture Capital funding, creating what is often known as a *Valley of Death*.[4] Start-ups often struggle to gain access to suitable management expertise too, from marketing to production engineering. The NIP was one of several national measures designed to address these particular shortcomings (tight investment funding) and missing skills. Indeed, VINNOVA explained the underlying rationale behind the NIP to be:

> "*based on the situation in Sweden, where research-related innovation was hampered in contributing to the national growth by* ***the weak structures supporting business creation in the early stages.*** *At that time* [prior to the NIP], *the government support focused on funding excellent research and researchers, but not on supporting commercialisation efforts and entrepreneurs, the latter being instrumental for an efficient exploitation of the research results.*
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> *The creation of new research-related companies was also hampered by the* ***lack of competence and knowledge among venture capitalists*** *about the very early stages of commercialisation combined with a lack of understanding among entrepreneurs for the deal-structures and requirements of venture capitalists. Although there were some exceptions, primarily among the technology parks, the average performance of the national innovation system still had to be refined*"[5].

The NIP established just over a dozen incubators around the country, with the task of supporting and accelerating the rate of development of high-growth potential start-ups as well as providing support to entrepreneurs and new companies in the pre-seed phase, where private investment is still deemed too risky. The policy rationale is clear, inasmuch as the national network of incubators was intended to facilitate a step change in the numbers of IP-based businesses being founded and also to substantially increase the numbers of high potential start-ups that cross the 'valley of death' and emerge as serious businesses.

From a broader, social perspective, it was expected that public support would lead to increased economic activity (directly and indirectly) and numerous spillover effects in terms of new know-how and improved products and services. Moreover, with good early support, businesses driven by innovative ideas are more likely to become attractive investment targets for venture capital.

Hence, it was crucial that incubators would strengthen the dynamic cooperation between industry, research and financiers, who facilitate the business creation, and incubators seeking to participate in the NIP required:

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[4] This rather colourful term is used to signify the dangerous nature of the gap that exists between a typical startup's financial requirements (necessary to cover negative cash flow in their early years) and the funds these young and unproven enterprises can secure from the formal venture capital market, which on average prefers to make larger equity investments in less risky undertakings.

[5] Inno Germany AG *Mid-term Evaluation of the Swedish National Incubator Programme Final report*, Karlsruhe, June 2008.

- A well functioning cooperation with universities, university colleges, research institutes and early-stage investors, based on research-related knowledge-intensive business ideas;
- A well functioning cooperation with start-ups.

The NIP was managed by VINNOVA in its early years, which later transferred responsibility (in 2005) to the newly established Innovationsbron, while simultaneously committing to a 10-year funding period for the measure. Both agencies cover(ed) the whole of the country through a number of regional offices. Hence, although the NIP was designed as a national programme, it was implemented on a regional level, by local actors. This administrative setup reflected one of the programme's (subsidiary) objectives, namely to develop professional, long-term sustainable networks in the regions (a legacy effect).

The pilot originally established 14 incubators, of which 10 were retained for the 2005-2007 programme period (in addition to two newly established incubators). Other objectives of the pilot focused on professionalisation of the management, team-building, mentoring, and business development processes.

The NIP incubators vary in legal structure and in ownership. Some are independent companies or foundations, but a few live within the larger structure of a science park. Only two of the incubators are profit making.

3. Designing the evaluation study

VINNOVA defined the requirement for a mid-term evaluation of the NIP as part of the overarching evaluation strategy that accompanied the creation of Innovationsbron and the public commitment to a 10-year national incubation programme. This evaluation strategy stated that mid-term reviews should be conducted every three years to check progress and to refresh the design for the next (three-year) phase of the programme. The evaluation objectives are outlined in Figure 3 below.

Figure 3 The evaluation objectives (taken from the Terms of Reference)

1. Describe and comment on the **basic outcomes of the NIP, from an international perspective** e.g.
- Overall improvement of the national capacity in delivering strong ventures with international business potential based on academic findings;
- Development of deal flow (number of proposals received);
- Quality of deal-flow (number of proposals supported, effect of the incubator programme on deal development etc.);
- Economic development of the incubators; turnover development, financing of operations, development of non-government funding, sources of funding.

2. **Assess the NIP as an intervention to improve early-stage commercialisation of R&D** in Sweden: NIP's role in the Swedish innovation system related to other structures and initiatives
- NIP's impact on significant system properties or success factors and indicators regarding successful early stage commercialisation;
- NIP's contribution to the development of strong innovation environments.

3. **Assess the NIP as an intervention to create and improve a profession** – the management of an incubator (assessment of the results of the NIP)
- Relation existing between the performance and quality of the incubator personnel and portfolio projects/companies compared to international incubator experiences;
- Effect of the NIP on the professionalism of the incubators in terms of competences, working processes, tools, exchange of experiences among the different incubators, etc.

4. Assess **efficiency of execution and management** of the NIP

- Planning and design vs. implementation: has the management initiatives and activities been relevant for the programme objectives?
- Resource allocation – balance between different kinds of resources;
- Staffing, organisation and work processes: has the organisation, staffing and work processes been rightly balanced against programme objectives and plans?

5. **Provide recommendations for the design** of NIP3 related to the presented plans and the evaluation results from the above mentioned areas.

6. The evaluation shall **compare the results of the above mentioned areas against the results from similar evaluations of other National Incubator Programmes**. This material will on the one hand serve as an input to the development of the evaluation and on the other hand serve the purpose of enabling a benchmark of the Swedish NIP against other National Incubator Programmes.

Source: Inno Germany AG *Mid-term Evaluation of the Swedish National Incubator Programme Final report*, Karlsruhe, June 2008.

There are a few points that could be highlighted here:

- Firstly, the Terms of Reference spell out objectives for the evaluation rather than articulate specific evaluation questions.
- Secondly, the mid-term evaluation's purpose was to look at the NIP's performance on a systemic, organisational and project level. The evaluation was on the other hand not concerned with the economic impact, insofar as it did not aim to measure the commercial development of businesses hosted by the incubators, and returns on investment.
- Moreover, particular emphasis was placed on understanding the programme performance on an international scale. This was done to achieve a better understanding of the Swedish programme results vis-à-vis other international initiatives. Indeed, the international comparative aspect is a crosscutting element, relevant to the objectives relating to outcomes, organisational aspects and the future development of the NIP.
- The Terms of Reference do not spell out specific requirements with regard to the methodological approach, thereby giving the evaluators considerable scope to elaborate a suitable methodological approach and analytical framework.

4. Implementing the evaluation: methodology and process

In addition to outlining the basic study design, VINNOVA's programme director – with the advice of the internal evaluation unit – elected to use an international review panel and compiled a shortlist of candidates based on prior knowledge of other countries' national programmes and experts.

The panel comprised incubator experts from four different countries, and was chaired by Rina Pridor, Director of the National Incubator Programme in Israel (the blueprint for the NIP). The selection criteria for the Expert Panel criteria were fairly straightforward, candidates needed to have demonstrable and deep expertise in managing major incubator programmes in other countries. The chair was approached first and she worked on the shortlist with VINNOVA, which subsequently constituted the other members of the panel. The panel then had its first meeting in Stockholm with VINNOVA and Innovationsbron – as well as meeting with a manager of one of the incubators – and together the parties developed the detailed specification for the review. Involving the peers in this final stage of the design of the evaluations helps to

secure the buy-in of the panel on the one hand and also means the specification benefits from the insight of the experts.

No one at VINNOVA or Innovationsbron was able to offer any estimate of the budget for the evaluation. However, the review looks similar in scope and design to other international peer reviews, where one might expect the overall cost to be around €80K-€100K. Typically, members of the panel are paid a small fee, perhaps €500 a day (20 person days for the chair, 10 for the other three experts = €25K), with a €10K-€20K charge for travel and expenses and a €50K commission for the work of the secretariat[6].

The international dimension of both the Expert Panel and the report itself, comparing Sweden with a number of other countries, was important for Innovationsbron in assessing and articulating the future development of the programme. The comparison countries selected – Austria, France, Germany, Israel and Italy – had analogous incubator programmes, but with a few more years' experience than NIP. Additionally, Israel's 'older' incubator scheme brought "interesting insights on a programme running for a long time and that had undergone already significant evolutions towards the sustainability of the incubators"[7].

As with most peer reviews, the supporting data collection and analytical methods were really quite straightforward:

1. A programme of 30 semi-structured interviews with incubator managers, company CEOs located in the incubators and selected regional actors (public agency and university stakeholders).
2. An in-depth case study describing one of the Incubators at some length. This is a qualitative description of the incubator, its development and role in the region. It discusses reasons for creating the incubator, its funding model, and relationship with hosted companies and Innovationsbron.
3. A desk study to compare and contrast analogous Incubator programme running in Austria, France, Germany, Israel and Italy. In the final report, these are just under 2-page long descriptions of context, objectives, incubator data – funding period and structure, ownership, management – and results to date.

Figure 4 Process and methodology

Timeline	Development
April 2007	Inno Germany was appointed with the responsibility of the secretariat for the evaluation.
May	An **international Expert Panel was established.**
June	The first meeting of the Expert Panel took place in Stockholm. During this first meeting, the Expert Panel heard from Innovationsbron and VINNOVA about the NIP and its policy context. An **interview with an incubator manager** enabled the Panel to get more familiar with the activities performed by the NIP incubators. The **methodology for the evaluation and the structure of the evaluation was finalised**. The **secretariat was designated to further elaborate** the methodology (programme of work, data requirements, timetabling, etc).
July	The **Panel approved the evaluation methodology**. In order to collect sufficient and relevant information to answer the study questions, it was decided to perform the following activities: • **Collection and exploitation of statistical material** available within

[6] For some comparable cost analyses, see the report of the Evaluation of the ESRC International Benchmarking Review Series, Paul Simmonds and Lark Parker-Rhodes, Technopolis Group, March 2011.

[7] Dr K. Petersen and L. Schmerber, Inno Germany AG *Mid-term Evaluation of the Swedish National Incubator Programme Final report*, Karlsruhe, June 2008.

	Innovationsbron with regards to the incubators involved in the NIP and their performance; • **Collection and exploitation of material on the NIP** provided by Innovationsbron and VINNOVA; • **In-depth interviews with the incubator managers** involved in the NIP; • **A case study** (Uppsala region) **based on interviews with regional stakeholders** dealing with innovation policy and especially with the commercialisation of early stage R&D results. It was **decided not to perform a specific survey with** client **companies** as Innovationsbron had in parallel appointed a Swedish consultancy with this kind of survey.
August and September	The **secretariat was delegated to compile and analyse the statistics provided by Innovationsbron and to carry out the programme of interviews.**
October	The **second meeting of the Expert Panel** took place in October. The outcomes of the **interviews and analyses performed by the Secretariat were presented, discussed and commented**. A **series of conclusions and recommendations** was drafted.
December	The **secretariat collected a written feedback from the Expert Panel** to the draft list of recommendation and transmitted an intermediate report to the clients.
March 2008	The secretariat **integrated the feedback** to deliver the final evaluation report.

Source: Adapted from Mid-term Evaluation of the Swedish National Incubator Programme Final report, Karlsruhe, June 2008.

Figure 4 outlines the evaluation process and methodology. Central to the organisation of the study was the early meeting of the Expert Panel, which was backed up by the desk research conducted by the Inno Germany study team. The opening meeting of the Expert Panel established their knowledge of the evaluated programme, and allowed them to ask initial questions to VINNOVA, Innovationsbron and to one of the incubator managers. At this point, the Expert Panel also fixed the methodology and the basic evaluation structure.

Following the initial interaction with the Panel, the secretariat compiled the basic statistics, conducted interviews and carried out the international benchmarking exercise (July through to September in the above Figure 4), and presented the results to the Expert Panel for discussion and a judgement. The Panel was primarily responsible for the development and articulation of the overall conclusions and recommendations.

Contributors to this case study recalled some data collection issues, specifically around the availability of good time-series data on incubator capacity, tenants and related investment activities. This missing data was discussed among the panel and is mentioned in the concluding chapters in the final report.

5. Effectiveness and efficiency of the evaluation

The evaluation was largely conducted between July and November 2007, although the constitution of the Panel and its preparation of a final assessment did mean the study took almost 12-months in total, that is, the final articulation and write up of the final report was developed between December 2007 and July 2008, bringing the total study period up to a year, which to an outsider looks somewhat drawn out.

The evaluation report presents the Panel conclusions and recommendations in a neat and accessible form, organised around the principal evaluation objectives. The report also presents the results of the accompanying desk research and primary data collection carried out by the secretariat: programme achievements in commercialisation realm; impact on incubation management; added value within wider Swedish landscape; efficiency of programme implementation; and an international benchmark.

The evaluation report offers very many valuable insights, particularly around critical success factors and funding strategies, reflecting the deep knowledge of the panel and the secretariat.

It does a rather less good job of addressing the evaluation objectives in a robust manner, and in most cases the particular study aspect is answered positively and based on a patchwork of slightly odd statistics (e.g. the volume of potential 'deals' processed by each incubator in a 12-month period, defined as any meeting with a prospective client or tenant that lasted for more than one hour) and the conviction of individuals sitting right at the heart of the programme.

The evaluation was not able to gain access to any baseline data or good national statistics on any aspect of knowledge transfer involving universities. Shortcomings were reported to be the result in part of teething problems with the programme's monitoring system, with an improving situation evident across the three years of the evaluation period (indeed, the improvements in the data collection system may have been a factor in the improving annual counts). There were also problems with reference data that stem from the existence of 'professors' privilege' in Sweden, where employees rather than employers own the IP that results from publicly funded research and institutions only record that fraction of total Knowledge Transfer activity that passes through the technology transfer office.

The evaluation concluded that the programme had made an important contribution to the underlying rate of business formation (IP-based businesses with a link to university research). It did so by comparing the annual count of new incorporations for the 12 incubators that recorded this particular data (around 90 such businesses a year) with a previous study commissioned by VINNOVA's predecessor, which estimated the formation rate of university-linked New Technology Based Firms at around 100 a year between 1990 and 2003. In essence, the Panel and the secretariat argued that the 90 new businesses that had derived *from just 12 NIP incubators* at the time of the mid-term evaluation indicated a much higher rate of business formation compared to the historical level indicated by the study undertaken on behalf of VINNOVA's predecessor. Thus, the evaluation concluded that the incubators had contributed to the creation of *additional* New Technology Based Firms – businesses which may not otherwise have been started – and as such, positively affected the performance of the Swedish innovation system.

The study also looked at value for money by comparing the estimated accumulated taxes of all tenant businesses combined with the public investment figures, which showed a return on capital employed of almost 300% between 2003 and 2007.

The review of the programme's impact on national Knowledge Transfer and incubation capabilities was quite limited, with the secretariat inviting incubation managers to rate (using a 5-point Likert scale) the contributions of the programme to their skills and knowledge. The results were broadly positive, and in particular managers reported deriving most value from the peer learning events and exchange of experiences within the network of incubators.

The results also suggest that the performance across the network was highly skewed with a small number of incubators (all linked with the larger, research-intensive city universities) delivering 80-90% of the new firms and financial investments. This raises some questions about the functioning of the national network, however the Expert Panel took a constructive line on this and suggested VINNOVA and Innovationsbron should look to share the experiences of the successful few with the less successful majority.

The report acknowledges its limitations and in particular its inability to resolve in any meaningful way the extent of the added value of the incubators to the national commercialisation endeavour.

The Panel noted that the timing of the evaluation was a little problematic inasmuch as successful commercialisation is more likely to take 5-10 years and that a mid-term review at three years could only ever hope to consider intermediate results.

According to the contributors to this case study, the evaluation report was read with interest and helped to frame the delivery team's ideas about the future evolution of the programme. The report formed part of a knowledge base that informed the development of the succeeding BIG programme. However, some of the insight was thought to be lost as the two individuals most closely involved with the mid-term evaluation left the agency before the start of the succeeding programme.

On the evaluation side, a number of changes have been implemented with the launch of BIG. Innovationsbron points out that BIG is a continuing programme, and not split into stages. There are no 'traditional' mid-term evaluations planned in the programme strategy. Rather, on an organisational and project level, evaluations are ongoing and conducted by the Incubators according to qualitative and quantitative indicators developed by Innovationsbron, and complemented by specific incubator data, developed by the Incubator management[8]. In other words, there has been a switch from intermittent evaluations to continuous, real-time evaluations using data and opinions gathered by individual incubators and recorded in the national monitoring system. This much tighter data collection and reporting process is arguably a direct response to the data collection issues encountered in the mid-term evaluation.

6. Conclusions and lessons learned

Overall, this was an interesting evaluation, which combined an international panel of implementation experts with a more conventional programme of data collection and analysis. The evaluation was well conceived inasmuch as it encompassed issues of efficiency and effectiveness and sought to ground its analysis in comparisons with the preceding situation in Sweden and to normalise those achievements with evidence from analogous programmes in other countries.

VINNOVA has made use of international expert panels before in relation to schemes that encompass research and innovation, with for example its highly regarded evaluation of the national Competence Centres. Although there is domestic know-how available to assist in evaluations in Sweden, it was argued that an international panel would be unbiased and also have the ability to provide a different perspective. The input of international expertise was seen as particularly important as the Swedish innovation system is comparatively small. Peer review furthermore exploits the fact that people (experts) can cope more readily with making judgements in complex settings with imperfect data.

The resulting report contains a great deal of qualitative material and operational insight, however the fundamental limitations in available data – in particular, baseline statistics and relevant national metrics – meant the Panel had very little of substance to work with and as a result reached neutral to positive conclusions and offered recommendations that were based to a large extent on their immediate personal experience in other countries and settings.

Notwithstanding these criticisms, it is not clear how a more robust or differently designed evaluation could have been carried out without incurring substantially higher costs to address the missing baseline data and to acquire relevant national statistics. The additional effort – likely to have been several times the actual cost – would have

[8] To complement the ongoing evaluation exercises, Innovationsbron is planning to commission larger studies, which, predominantly, will revolve around Innovationsbron's hypothesis constituting the underlying rationale of the programme (the intervention logic), and the programme's role in the overall innovation system in Sweden.

imposed an arguably unreasonable burden on the fledgling incubators at a key point in their lifecycle and would have required very active engagement with and support by the entire academic community.

Ultimately, the evaluation was said to have been positively received and meant the programme was able to continue and indeed develop and extend its offer.

The mid-term review's impact on evaluation practice is not clear, however Innovationsbron has greatly strengthened its monitoring systems over the intervening period, which may indicate a direct response to the study in question.

More significantly, it has moved towards continuous evaluation and away from periodical external assessments by international experts.

Innovationbron's rationale for introducing ongoing evaluations was to avoid what are perceived as the drawn-out processes associated with mid- and ex-post evaluations. The continuous feedback of ongoing evaluations helps with programme steering, permitting issues to be identified before they grow. Moreover, ongoing evaluations – with their reliance on standard metrics and routine feedback – tend to be more efficient and economical control mechanisms as compared with more formal evaluations. And looking beyond the mid-term evaluation of the NIP, it is apparent that ongoing evaluations are becoming more common in Sweden's innovation community, with stakeholders highlighting its pragmatic approach.

Swedish innovation agencies are aware that from a political perspective, evaluations should provide answers to e.g. the number of employment opportunities created or number of start-ups through a particular intervention. As an indirect and long-term impact – and not in isolation to other influencing factors – this is incredibly difficult to measure. In order to be able to go public and provide ministries with estimates on indirect impacts that are plausible, Innovationsbron is dependent on commissioning high-quality and reliable studies.

Interviewer and case study author: Malin Carlberg, Technopolis Group UK

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