



Science and Technology Engagement Pathways (STEP)

Community involvement in science and
technology decision making

STEP



Australian Government

**Department of Industry
Innovation, Science, Research
and Tertiary Education**

STEP (Science & Technology Engagement Pathways) is a community engagement framework developed under the National Enabling Technologies Strategy – Public Awareness and Community Engagement (NETS-PACE) program within the Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE). Developed through a multistakeholder process, STEP will provide guidance on how to involve the wider community in deciding directions for science and technology.

CONTENTS

Executive Summary	P01
Introduction	P01
STEP Principles	P02
STEP Process and Platform	P03
STEP Engagement Models	P04
The STEP Framework	
Background	P06
STEP Principles in Detail	P08
STEP Evaluation Criteria	P15
STEP Process and Platform	P16
STEP Engagement Models	P18
Appendix A	P19
Multi-stakeholder Workshop Participants	
Appendix B	P21
Public engagement in science and technology – the international context	

Executive Summary

Introduction

In democracies, there is a recognition that citizens should have input into decisions that affect them. Communities are consulted about city planning, regional development and infrastructure projects like roads and waste facilities, so why not new developments in science and technology, which may affect them just as much?

Experience in these other areas has shown that effective community engagement can improve the quality of decisions. Could we as a society steer the development of new technologies in line with social goals and needs by having broad community input in their development, management and governance?

The STEP (Science and Technology Engagement Pathways) framework will guide community engagement under the National Enabling Technologies Strategy, working with a range of decision makers about a range of decisions and issues associated with enabling technologies (notably biotechnology and nanotechnology).

STEP also provides a guide for community engagement efforts within other relevant organisations, including other government agencies, research organisations, industry and community groups who make decisions about science and technology.

The STEP framework is based on a set of principles, and provides a process, a platform, and a number of models of engagement. The framework is not a rigid protocol, but recognises the important role of flexible, responsive engagement in better informing decisions.

More information about the STEP framework and STEP engagement activities can be found at www.innovation.gov.au/STEP

STEP Principles

STEP engagement is guided by the following principles:

1. Commitment and Integrity

A high level of commitment and integrity amongst organisers and participants, including mechanisms for transparency and accountability.

2. Clarity of objectives and scope

Clarity about what the engagement is for, what's on the table, and what success would look like.

3. Inclusiveness

Inclusiveness of the diversity of people and views, so that a range of perspectives is brought to the discussion and all those with an interest are able to be heard.

4. Good process

Includes an appropriate and structured method, communication and consultation with participants throughout, and appropriate, independent oversight and evaluation.

5. Quality information/ Knowledge sharing

Relevant, accurate and balanced information and knowledge sharing.

6. Dialogue and open discussion

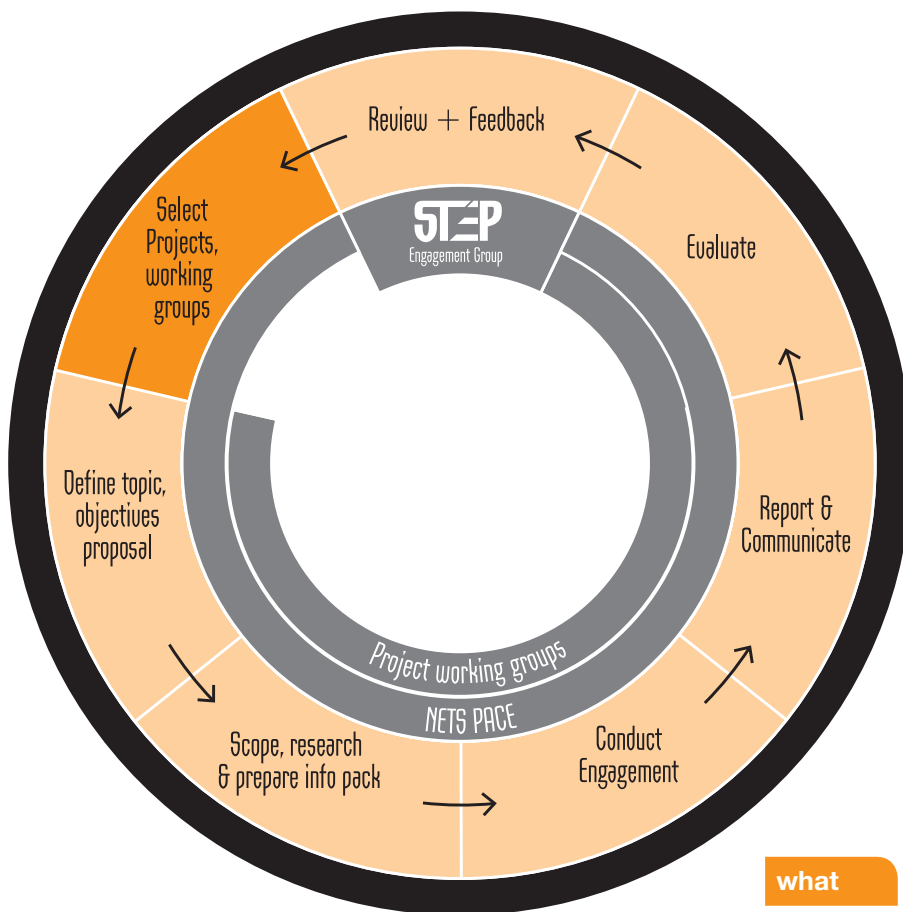
Genuine, interactive deliberative dialogue; opening up discussion rather than closing it down.

7. Impact on decision making

Demonstrated influence on decision making.



STEP Process and Platform



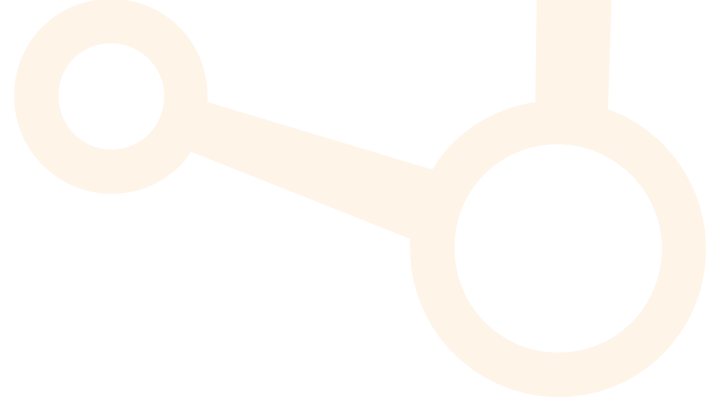
what

who

This figure shows the STEP process (what is involved) and the STEP platform (who does it). The overall aim of STEP is to improve science and technology decision making.

The STEP platform involves NETS-PACE staff, who will monitor potential engagement topics with input from diverse groups, including NETS Expert Groups and a Community Reference Panel.

NETS-PACE staff will work with project working groups (of relevant, diverse specialists within and outside of government) to define, scope, research and conduct engagements and then to report results. Working groups will assist in the evaluation of projects. Regular review and advice will be provided by a multistakeholder STEP Engagement Group.



STEP Engagement Models

The following models suggest alternative types of engagements, depending on the issue and status of decision making about it. Each model will follow the process described above.

Decision-Based Dialogues

Dialogues designed in partnership with particular decision makers about specific decisions; involving the wider community/diverse perspectives; with commitment from the decision maker to take account of the input in making the decision.

e.g. Dialogue to inform the review of regulations, dialogue for input into new research priorities.

Awareness-Raising Dialogues

Dialogues between particular decision makers (as a group) and other groups/perspectives/stakeholders; to raise awareness about diverse perspectives and about decision-making processes; aimed to educate, inform and broaden decision-making.

e.g. scientists and engineers dialogue with builders and home-owners about new materials.

Participatory Technology Assessments

Deliberative dialogues between decision makers and community, conducted in conjunction with research and analysis on areas that affect a range of decision makers and decisions; consideration of issues, perspectives and implications to inform decisions in the future.

e.g. Assessing the future societal implications of synthetic biology in Australia.

Discursive Public Forums

Forums open to the public involving a panel that represents a range of perspectives and a variety of processes to facilitate and encourage participant discussion and questions.

e.g. discussion of genomics or genetic testing and ethical issues raised.

STEP (Science & Technology Engagement Pathways)

Introduction

In democracies, there is a recognition that citizens should have input into decisions that affect them. Communities are consulted about city planning, regional development and infrastructure projects like roads and waste facilities, so why not new developments in science and technology, which may affect them just as much?

Experience in these other areas has shown that effective community engagement can improve the quality of decisions. Could we as a society steer the development of new technologies in line with social goals and needs by having broad community input in their development, management and governance?

What is STEP?

The STEP (Science and Technology Engagement Pathways) framework is a new approach to communication with the wider community about science and technology. STEP is about opening up conversations about new developments in science and technology at an early stage with a broad range of stakeholders including citizens. It is driven by the idea that early, good quality engagement can lead to better decisions, directions and outcomes – ones that are more desirable, legitimate and sustainable. Engagement can help to avoid some of the problems and conflicts that have characterised new technologies in recent decades.

STEP will guide community engagement under the National Enabling Technologies Strategy (NETS). The Public Awareness and Community Engagement program under NETS (NETS-PACE) will work with a range of decision makers and stakeholders about a range of decisions and issues associated with enabling technologies (notably biotechnology and nanotechnology).

STEP also provides a guide for community engagement efforts within other relevant organisations, including other government agencies, research organisations, industry and community groups who make decisions about science and technology. For advice about using STEP in your organisation, please contact step@innovation.gov.au.

The STEP framework is based on a set of principles, and provides a process, a platform, and a number of models of engagement. The framework is not a rigid protocol, but recognises the important role of flexible, responsive engagement in better informing decisions.

Implementation of STEP

NETS-PACE launched STEP in early 2012 with a year of activities:

2012 STEP into the Future

This year will be a trial of the STEP approach and will allow development and application of a range of tools and methods. STEP activities will be promoted and showcased on the STEP website, which will also be a communication hub for STEP.

More information about the STEP framework and STEP engagement activities can be found at www.innovation.gov.au/STEP



Background

There is a growing trend of engagement with communities about decisions that affect them. Urban planning, regional development, and environmental management are areas increasingly informed by community engagement. Experience has shown that early, appropriate and high quality engagement not only reduces conflict and increases legitimacy; it also improves the quality of decisions.

Science and technology decisions are not traditionally the subject of community engagement. If you compare the selection of a site for a waste disposal facility with the development and use of nanotechnology in cosmetics, for example, the reasons for this become clearer:

- » Science and technology decisions are national or global in reach, so the engagement task is huge
- » Science and technology decisions involve multiple decision makers (scientists, industry, government, consumers), are complex and non-linear, and operate over large timeframes (typically decades), so influencing decisions is complex and difficult
- » Science and technology decisions have technical aspects which require knowledge that many members of the community may lack

Increased calls for public engagement in science and technology decisions in recent decades, particularly about emerging technologies such as biotechnology and nanotechnology, stem from controversy and social conflict about these technologies. Some stakeholders argue that wider publics have the right to be involved in decision making about technologies that could have a big impact on their lives. Other stakeholders have been concerned about the unprecedented effect that public opposition has had in limiting the commercial uptake of certain technologies such as genetically modified crops. Controversy is stimulated by concerns about risk and ethical issues, but is also about how science and technology are governed and how they contribute to the public good. (see Appendix B – International Context)

The Multistakeholder Engagement Process

In response to these developments, the National Enabling Technologies Strategy – Public Awareness and Community Engagement (NETS-PACE) section within the then Commonwealth Department of Innovation, Industry, Science and Research (DIISR) conducted a multistakeholder engagement process in 2010 – 2011. The aim of the process was to develop a framework for community engagement in decision making about science and technology, particularly enabling technologies¹. The STEP framework is the result of that process and the hard work of all those who participated.

The multistakeholder process was a collaboration involving representatives from the full range of stakeholder groups. Previously, stakeholders had held disparate views about public engagement and its purpose, with some, notably NGOs (public interest, community and trade union organisations) and social science academics, criticising public engagement work undertaken under NETS. Key criticisms were that engagement activities had little impact on decision making and that framing was overly positive about technology, with an implicit aim of gaining public acceptance for it, and for decisions already taken. The intention of a collaborative process was to draw on a range of knowledge and perspectives, to work through areas of difference, to model and demonstrate engagement methods, and to improve the credibility and implementation of the framework.

The multistakeholder process involved two stages. This first stage was a series of stakeholder workshops with consumer health, trade union and public interest organisations, researchers, industry, government and members of the general public. This stage was designed as an inclusive, open listening exercise to elicit a range of views without necessarily seeking consensus. Each workshop culminated in a report summarising the issues arising and a list of principles. From each workshop, a small working group of individuals was selected

¹ Enabling technologies are emerging and rapidly developing areas of technology that have significant potential to transform industries and sectors and to impact on society (positively and negatively) e.g. nanotechnology and biotechnology.



(or self-selected) to go forward to represent the group at a multistakeholder workshop. Follow-up communication was facilitated by a website, allowing further input from participants, including on design of subsequent workshops.

The subsequent multistakeholder workshop, held at Old Parliament House in Canberra on the 29th August 2011, brought together 40 people with divergent positions, interests and perspectives on enabling technologies and on community engagement (see Appendix A — Multistakeholder Participants). Despite significant disagreement on a number of issues, there was remarkable consensus about a set of core principles for community engagement which provide the basis for the STEP Framework.

All workshops were facilitated by independent facilitators who were also experts on community engagement and were evaluated by an independent evaluator who provided input throughout the process. The process won the 2011 Project of the Year Core Values Award from the Australasian Branch of the International Association for Public Participation (IAP2).

Taking STEP Forward

Much of the discussion during the multistakeholder process was about public engagement — how to bring unheard voices into discussions about new technologies. However, the resulting STEP framework is about community engagement — how to bring the wider community, including ‘ordinary citizens’ but also civil society groups, scientists, business people and professionals and government together in dialogue about enabling technologies, and science and technology more generally, in the context of decision making about them. Engagement is a process that involves sharing information and perspectives, dialogue about issues of mutual concern, and action resulting from new understandings of the issue.

The process identified many challenges associated with effective community engagement in science and technology decision making, including:

- » building capacity and interest within the community to discuss science and technology
- » extending the reach of engagement to include the wider community, including ‘hard-to-reach’ groups and those who are not usually engaged with science and technology
- » providing good quality information that acknowledges uncertainty, complexity and diversity of perspectives
- » balancing the contributions of civil society and specific stakeholder groups, particularly in view of power imbalances
- » avoiding ‘institutional capture’ and ensuring credibility and transparency
- » having impact on decision making

These are ongoing challenges for the STEP Framework, which is intended to provide a dynamic guide to community engagement for NETS and other relevant organisations that can be built upon and improved over time. STEP aims to inform and engage communities, capture public perspectives, concerns and visions, and inform and influence decision making relevant to science and technology, with an emphasis on enabling technologies. The multistakeholder process demonstrated that individuals and groups with divergent views can work together to develop shared understandings, new insights and joint recommendations — in this case, the principles and elements of a framework that will guide practice in this area. The commitment of this group reflects the potential to improve community engagement and science and technology governance and to “step into the future in a positive way”².

These principles were developed largely by participants in the multi-stakeholder process, initially in stakeholder workshops and with consolidation at a multi-stakeholder workshop. They are best practice principles; they are aspirational and provide a guide to good practice for organisers (and participants) of community engagement in science and technology decisions.

2 A quote from one of the participants at the multistakeholder workshop.



STEP Principles in Detail

1. Commitment and Integrity

Community engagement should have a high level of commitment and integrity, including mechanisms to ensure transparency and accountability.

SUB-PRINCIPLES

Honesty, responsibility and probity

The success and credibility of the process requires honesty, responsibility and probity on the part of all participants, but especially organisers. This is important for maintaining trust and relationships amongst participants and requires good process, particularly in communicating with participants and providing them with information, feedback and opportunities for input in a timely way. Oversight involving representatives from diverse stakeholder groups can assist credibility and accountability.

Proactive and early engagement

Engagement needs to happen early in the course of decision making and should be proactive rather than strategic – it should not be used to manage conflict or potential conflict over decisions that have already been made.

Buy-in from decision makers, support from stakeholders

Gaining commitment from decision makers is critical to effective engagement. It is best achieved when the value and benefits of engagement are demonstrated and promoted, and when there is support from diverse stakeholders and leadership and championship within organisations and bureaucracies. Building a reputation for integrity and effectiveness is important.

Open and honest processes

Community engagement must be kept open, avoiding pre-determined outcomes and hidden agendas. In relation to decisions, it is most important to establish ‘what’s on the table’, i.e. what part of a decision is open and what elements are non-negotiable. Engaging on a decision that has already been made, or where decision makers are not open to public input, is bad practice.

Accountability and transparency

Mechanisms should be established that require decision makers to account for how the engagement influenced decision making. There should be a high level of transparency, with accurate recording and reporting of process and outcomes, making the whole process accessible. Any funding source should be revealed at the outset along with the interests and conflicts of interest of all parties .

CONSIDERATIONS

What level of transparency is appropriate? Community engagement exercises the democratic right of citizens to have a say in decisions that affect them. In this sense, there should be a high level of transparency, with deliberations and results made publically available. Early engagement with decision making processes, before commitments are made to particular courses of action, is crucial. At early stages, there are often sensitivities, particularly about risks, impacts and commercial-in-confidence information. These may deter decision makers from entering into or initiating public debates. In order to take these opportunities, there may be situations where engagements are conducted in such a way that decision makers are able to speak candidly about issues without their comments being made public.

2. Clarity of Objectives and Scope

Community Engagement should be grounded in clarity of purpose, objectives and scope.

SUB-PRINCIPLES

Clear and measurable goals and objectives

Community engagement should have clear and measurable goals and objectives, based on clearly defined decisions, with agreement about what success would look like. The objectives and scope of the engagement need to be clear, appropriate and agreed upon by participants and decision makers. This requires the involvement of all relevant parties from the outset.

Clarity of roles and expectations

Clarity about the roles and expectations of participants is essential, particularly in relation to where an activity might be on the spectrum of engagement (e.g. is it consultation, collaboration or participation?). Activities aimed solely at promotion of a technology or line of research are outside the scope of this framework.

Identifying the decision

A key aspect of scoping is identifying the decision that is the subject of the engagement, i.e. what is on the table. This includes clarity about what aspects of the decision are subject to change; including both what is possible (is the decision still open) and what is permissible (can changes be made). The latter requires consideration of both political and legal constraints including relevant legislation and international agreements.

Defining the scope

The scope needs to be defined in terms of:

- » the topic or issue and its framing
- » available information and evidence and uncertainty
- » the decision context
- » the social context and who should participate
- » the appropriate method
- » the outputs and audience
- » evaluation and communication processes.

The scope should also take account of timeframes and budget. It is important that scoping is done in a transparent way and with oversight from diverse stakeholders e.g. a reference or working group.

CONSIDERATIONS

In practice, scoping will require an iterative process to establish who needs to be involved and seek their input on the proposal. The exercise of setting objectives and scope should be realistic in the context of the situation and the time and resources available. This does not mean that big picture, strategic or high-level decisions should be considered 'off limits', but that engagement needs to be designed carefully to achieve impact.



3. Inclusiveness

Community engagement should be inclusive of the diversity of people and views.

SUB-PRINCIPLES

Balanced involvement

Involvement or representation of different groups should be balanced and groups should be supported to participate, with appropriate accountability measures. The choice of Individuals or groups to not take part should be respected.

All views valued and respected

All voices and views should be valued and respected, not just those that are loudest or best articulated. Diversity in perspectives should be sought and embraced, including critical views. Differences should be explored through reasoned and respectful discussion, with supporting evidence where appropriate and with recognition of differences in perspective.

A positive, supported environment

A positive, supported environment should be created to promote inclusive participation. This requires good facilitation, accessible venues, resourcing of participants to be involved and education and up-skilling of all participants (community and expert).

A range of formats

There should be a range of formats and channels of information and communication, sensitive to participants' education levels, cultural backgrounds and abilities.

CONSIDERATIONS

Who should be included? Ideally, all groups who are potentially affected by a topic/decision should be included. In theory, this could potentially mean everyone in the nation – which is of course impractical. So in practice engagement must always involve judgements about who should participate, and challenges associated with involving a breadth of participants. Nevertheless, community engagement should seek to capture a diversity of people and views and should be open to the involvement/scrutiny of a range of people and perspectives, including critical ones and various different types of expertise and knowledge.

For involving the general public, different approaches can be taken, including random selection based on demographic criteria and inclusion of a significant proportion of a population (e.g. through online engagement). This ensures a breadth and diversity of public perspectives, rather than just those who are already highly engaged on the topic. In this regard, efforts should be made to include marginalized groups in engagement processes. At the same time, the contributions of interested/engaged citizens/groups should also be recognised and welcomed. These considerations are also true for stakeholder groups such as researchers and industry, which are also diverse.



4. Good Process

Community Engagement should follow good process, including an appropriate and structured method, communication and consultation with participants throughout, and appropriate, independent oversight and evaluation.

SUB-PRINCIPLES

Guided by principles

The process should be rigorous and well planned, guided by principles and appropriate to the objective and situation.

Oversight

Oversight should involve diverse perspectives and could take various forms, such as steering committees, reference groups or independent voices.

Evaluation

Evaluation should be guided by principles, should be structured into the process and should involve participants. There should be mechanisms for evaluation to inform future activities.

Good facilitation

Good facilitation is an important aspect of good process, as part of creating a positive environment for mutual learning and to stimulate genuine dialogue. Facilitators should be independent, as neutral as possible, and experienced in community dialogue.

Communication

Communication is a key aspect of good process. Communication with participants should begin early and be maintained throughout, including follow-up after the engagement. Good process should include consideration of the outputs of the process – format (e.g. reports, websites or presentations), content (e.g. information about diverse perspectives, recommendations or options), audiences (publish widely or target a particular group), with the aim of meeting the objectives.

Commitment of adequate funding and resources

Good process requires commitment of adequate funding and resources and adequate time, including for follow-up, particularly in relation to decision influence.

CONSIDERATIONS

How good is good enough? These principles indicate best practice in CE, but practice will always be constrained by time, resources and capacity. There are always trade-offs when conducting engagements in a reasonable time-frame within a budget. Setting clear objectives and scope is necessary to achieve best possible engagement, and oversight is also important. Agreement should be sought at an early stage about what is possible and how an engagement can achieve its objectives given the constraints.

5. Quality Information/ Knowledge Sharing

Community engagement should be supported by relevant, accurate and balanced information and knowledge sharing.

SUB-PRINCIPLES

Balanced information and diversity of views

Information should be balanced in the sense of coming from a broad range of groups/interests, including scientists, industry, civil society organisations and community groups. It should reflect a diversity of perspectives, views and opinions and should be sought through various means. A culture of sharing, rather than providing, information should be encouraged, acknowledging that important information may come equally from community, organisational and expert sources.

Supported by evidence

It is important that information is supported by evidence (verifiable, where possible), recognizing that evidence can come from a variety of sources, and that the evidence base constantly changes with new data.

Acknowledgement of uncertainty, complexity and values

Uncertainty about evidence or information, or where it is contested, should be clearly acknowledged. It should also be acknowledged that information, even 'scientific' information, is rarely value-free.

Accessible information

Participants should receive information in accessible forms e.g. in plain English, pitched at the right level and in different formats (visual as well as textual).

Knowledge sharing

Participants knowledge should be recognized, valued and shared, acknowledging the rich understanding that can emerge when diverse perspectives are shared. Community knowledge and values should be given equal importance to technical and expert knowledge in engagement activities.

CONSIDERATIONS

Community engagement topics generally address societal aspects of science and technology and thus don't focus on the purely technical. While important as background, technical information often generates uncertainty and disagreement. It is important, therefore, that information is supported by evidence, that uncertainty, complexity and lack of agreement are acknowledged, and that a diversity of perspectives is presented. Science and technology decisions should not be made purely on the basis of scientific information or expertise, but should draw on community values and broader societal considerations.

When people make sense of information, it adds to their knowledge, which combines the 'facts' they learn with their values. People have different knowledge because they have learnt different things and have different perspectives and values. Taking the approach in CE of *sharing knowledge* thus acknowledges these differences and how they can help to build a richer understanding of science and technology issues, beyond purely technical perspectives. A knowledge sharing approach avoids the 'knowledge deficit' assumption of much science communication, and allows participants to enter the process on an equal footing, having their own knowledge valued in the process. It also puts the onus on organisers to frame the topic in a context that is meaningful to participants, and that also draws on their knowledge.

6. Dialogue and Open Discussion

Community Engagement should involve genuine, interactive, deliberative dialogue and should open up discussion rather than closing it down.

SUB-PRINCIPLES

Two-way engagement

Communication must be more than one-way. All should enter the engagement in a spirit of mutual respect, being prepared to listen and learn, and to value all contributions. This requires a commitment from participants to open, honest discussion, to listening as well as speaking, to compromise and flexibility, and a willingness to shift their views and expectations.

Capacity-building

Community engagement may benefit from specific capacity-building in this area e.g. training in dialogue methods (for organizers), listening skills (for participants), and requires sufficient time for dialogue and reflection. Facilitators need to be skilled in using methods that encourage listening and constructive dialogue.

Freedom from fixed perspectives, deliberative

Engagement should be able to free participants from fixed perspectives and affiliations (e.g. membership of a particular stakeholder group) and allow them to explore other perspectives, thus creating the conditions for deliberation.

Transformation

CE is transformative, because participants reflect on and develop their own perspectives based on understanding others. Interdisciplinary perspectives, such as provided by the arts, should be welcomed to deepen and enrich dialogue and people's experiences of engagement.

Flexibility and compromise

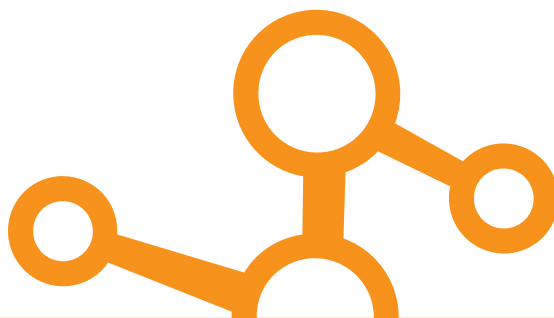
The topic/question must be open to new perspectives and solutions without predetermined answers/outcomes. The decision context should reflect a capacity for flexibility and compromise. Discussions should take as wide a view as possible, considering a range of possible options and futures and 'the big picture'.

Risk-taking and Forward thinking

Engagement discussions should be risk-taking and forward-thinking because genuine dialogue is elusive and requires creative thinking and careful hosting to succeed. If possible, discussions should challenge narrow framings and false dualities (e.g. the precautionary principle, risk/benefit) and should look to the future.

CONSIDERATIONS

Should community engagement seek to achieve consensus? Engagement should not be adversarial. It should be appreciative and seek common ground and shared understandings based on openness to others' perspectives. Consensus is desirable if it exists. However, inclusive dialogue, rather than consensus, should be the ultimate goal, and dissent should be allowed and acknowledged.



7. Impact on Decision Making

Community engagement should have a demonstrated influence on decision making.

SUB-PRINCIPLES

Connected with decisions

Engagement activities should be connected with particular decisions, decision makers or decision areas and should identify a path for decision influence in their design; this should provide a transparent link between process and outcome. This should be established during the scoping/planning phase, which should involve decision makers.

Establish channels of impact

Early discussions should be held with decision makers on the ways that community inputs will be received, recorded, analysed and integrated in the decision making process.

Involve decision makers

Engagement should involve commitment by decision makers to respond to recommendations and concerns in a transparent, responsive way. Ideally, decision makers should take part in engagement activities.

Realistic in its expectations

In establishing a path for decision influence, engagement planning should be realistic in its expectations, based on an assessment of the openness of the decisions/decision makers to change. In this way, participants' time and effort in participating will be linked to decisions, actions and outcomes – it will lead to something.

CONSIDERATIONS

Relevant decisions (including public policy and R&D decisions) are made by a range of decision makers - government bureaucrats at Federal and State levels, politicians, regulators, companies and industry peak bodies, research managers and scientists. Engagement may have direct impact, where recommendations and concerns are specifically addressed in policy or other outcomes; or it may inform opinions and influence decisions in less direct or longer-term ways. The latter is harder to measure but can be equally important. Community engagement can inform decision making by providing information about values, concerns and preferences; by reframing decision topics; and by providing new information, particularly about local contexts.

Should the public *participate* in decision making? Empowering members of the public to participate directly in decision making is an aim of much public participation theory and practice. It is also an aim of some of the participants who helped develop this framework. However, such empowerment requires either the agreement of decision makers or the imposition of a mandatory requirement on them. This framework is not binding on relevant policy makers. While there may be instances where citizens are given decision making power within a particular community engagement exercise, this will certainly not always be the case. For the purposes of this framework, responsibility for decision making will remain with relevant decision makers.



STEP Evaluation Criteria

All projects should be evaluated according to whether the engagement achieves each of the following:

- » Proactive and early engagement
- » Connection with decisions and involvement of decision makers
- » Support from/involvement of stakeholders
- » Accountability and transparency
- » External oversight

- » Clear and measurable goals and objectives, identifying the decision/s
- » Clearly defined and realistic scope, roles and expectations
- » Good process guided by principles
- » Commitment of adequate funding and resources
- » Good facilitation

- » Inclusiveness and balanced involvement
- » All views valued and respected in a positive, supported environment
- » Balanced, accessible information and a diversity of views
- » Information supported by evidence with acknowledgement of uncertainty, complexity and values
- » Knowledge sharing

- » Two-way engagement
- » Capacity-building for dialogue
- » Openness, deliberativeness, flexibility and compromise
- » Risk-taking and forward thinking

- » Ongoing communication and follow-up
- » Evaluation

Evaluation is most useful when it is reflective and qualitative, with consideration of the extent to which the engagement honoured the Principles, the extent to which the engagement achieved its objectives, the outcomes of the engagement, and factors which influenced the quality and outcomes of the engagement.

STEP Process and Platform

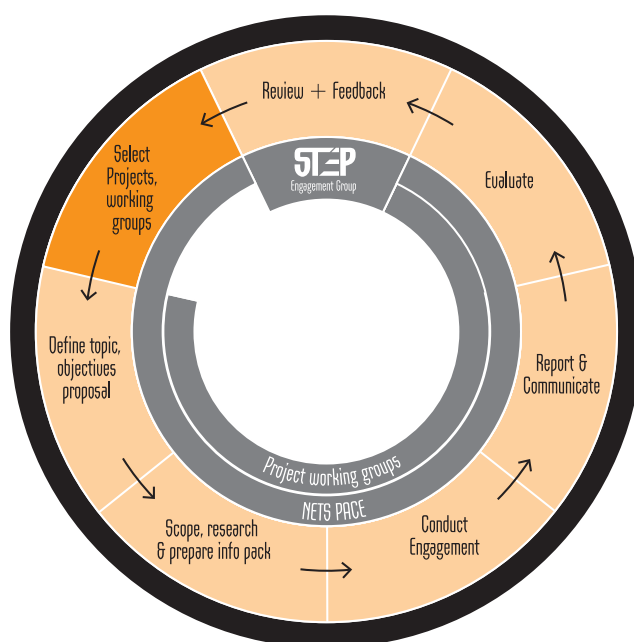
The STEP Process – what will be done

STEP engagements will be conducted according to the following process. Note that the process will vary depending on the particular engagement and the engagement model used, i.e. some smaller discursive forums may not involve research and may involve a condensed process, whereas participatory technology assessments may involve additional research and more than one round of engagement.

- » Monitor decisions and issues associated with science and technology developments, with input from a diversity of sources (including STEP Engagement Group, NETS expert groups, Community Reference Panel) general public via website.
- » Select topics for engagement and establish working groups to assist in the design and conduct of the engagement
- » Define topics, including identifying the decision/s to be informed by the engagement, defining the objectives of the engagement, and considering any timeframe, practical or political constraints associated with the engagement objectives

- » Scope projects to establish framing, participants, methods and evaluation and communication strategies
- » Research and develop an information pack for the project if appropriate which summarises the topic, decision, context (including constraints), objective/s, diverse perspectives and relevant evidence
- » Organise and conduct the engagement with independent facilitation
- » Report and communicate the results to relevant audiences, including reporting on methods, process and findings
- » Evaluate the engagement, involving an independent evaluator (for large scale engagements) or the working group (for small scale engagements)
- » Oversee and review the framework, considering topics, reports and evaluations; this will involve the STEP engagement group who will meet regularly to consider the work undertaken under STEP and give advice and direction. The framework will be formally reviewed after one year.

This figure shows the STEP process (what is involved) and the STEP platform (who does it).



what

who

The STEP Platform – who will do it

The process will be conducted by NETS-PACE staff, working together with project-specific working groups of relevant, diverse specialists. NETS-PACE may commission external project managers where appropriate, in which case a NETS-PACE staff member will participate in the working group. A multistakeholder STEP Engagement Group will provide regular review and advice and input will be sought, particularly in the selection of topics, from a range of groups including the STEP Engagement Group, a Community Reference Panel, relevant decision makers, NETS expert groups and members of the general public.

STEP Engagement Group

This multi-stakeholder group will be selected from amongst the multi-stakeholder participants, the Stakeholder Advisory Council and other relevant groups to provide advice and oversight of the process. Approximately twelve people will be selected to represent the diversity of stakeholders. Membership will also include two specialists in public participation. The group will meet at regular intervals to consider engagements conducted and planned and to give NETS-PACE feedback and advice to inform further work. They will be involved in the review of STEP following the first year of implementation.

Project Working Groups

These are groups of about five people, who have knowledge of the topic, and represent different perspectives, interests or expertise relevant to the topic, plus a community engagement specialist/practitioner. In the case of decision-based dialogues, a representative of the decision making body will also be on the working group. These groups will work with NETS-PACE to develop the project proposal and conduct the engagement. They may also participate in the engagement. They will be resourced to participate.

Community Reference Panel

This is a panel of approximately 50 people representing the diversity of the Australian community, who agree to be part of the panel for two years and to provide input to projects during this time. A proportion of the panel will be recruited using random selection based on demographic criteria and a proportion will be selected based on applications through the website. Communication with this panel will be largely on-line, depending on the requirements of the panel members.

NETS Expert Groups

These are groups set up under NETS and include the Stakeholder Advisory Council (SAC), the Expert Forum and the Health, Safety and Environment (HSE) group. They will be asked for input on new topics and on current projects where appropriate.

STEP Website

The framework will have its own website. It will feature news and reports of upcoming and completed engagements, information about the STEP framework and platform, and opportunities for input. The site will be on the Innovation home page at www.innovation.gov.au/STEP.

STEP Engagement Models

Decision-Based Dialogues

Purpose: To provide input to science and technology decisions

Approach: Dialogues designed in partnership with particular decision makers about specific decisions; involving the wider community/diverse perspectives; with commitment from the decision maker to take account of the input in making the decision.

Examples:

- » Regulatory review (regulatory agencies or review panels)
- » Standards, guidelines (regulatory agencies, funding agencies)
- » Government decisions about strategies, incentives and initiatives (ministers, government departments, government advisors)
- » Funding priority setting (funding agencies)
- » Research priority setting (research organisations, companies)
- » Policy positions (community groups)
- » Product development (companies)

Awareness-Raising Dialogues

Purpose: to raise awareness among science and technology decision makers and the wider community

Approach: Dialogues between particular decision makers (as a group) and other groups/perspectives/stakeholders; to raise awareness about diverse perspectives and about decision-making processes; aim to educate, inform and broaden decision-making.

Examples:

- » Regulators + farmers/community groups/mothers
- » Funding agencies + general public/professionals
- » Scientists + engineers + tradespeople/unions + homeowners

Participatory Technology Assessments

Purpose: to share balanced information about societal implications of science and technology

Approach: Deliberative dialogues between decision makers and stakeholders, in conjunction with research and analysis on areas that affect a range of decision makers and decisions; consideration of issues, perspectives and implications to inform decisions in the future.

Examples:

- » Emerging areas e.g. synthetic biology, bionics, nano-devices, geoengineering
- » Technology issues (health impacts, environmental impacts, social impacts, workplace issues, IP) e.g. nano-silver impacts, gene patents
- » Technology futures e.g. technology and the ageing population, technology and quality of life, technology, privacy and conviviality

Discursive Public Forums

Purpose: to raise awareness and encourage discussion

Approach: Forums open to the public involving a panel that represents different perspectives and a range of processes to facilitate and encourage participant discussion and questions.

Examples:

- » Café Scientifc
- » Science in the Pub
- » Public forums at conferences
- » World café, circle discussions, other dialogue methods

Appendix A

Multi-stakeholder Workshop Participants

Social Scientists and Public Engagement Practitioners

- » Kristen Lyons, School of Social Science, UQ
- » Lyria Bennet Moses, Faculty of Law UNSW
- » Margaret Puls, Beef CRC
- » Nicola Marks, Science & Technology in Society, Uni of Wollongong
- » Dick Osborn, Centre for the Public Awareness of Science, ANU

Scientists

- » Tara Schiller, Monash University
- » Suzanne Smith, Australian Nuclear Science and Technology Organisation (ANSTO)
- » Chamindie Punyadeera, Australian Institute for Bionengineering & Nanotech (AIBN), UQ
- » Richard McQualter, Australian Institute for Bionengineering & Nanotech (AIBN), UQ

Industry

- » Geoff MacAlpine, Plastics and Chemicals Industry Association (PACIA)
- » Leo Hyde, Dupont
- » Kim Leighton, Aus Food and Grocery Council
- » Andrzej Kilian, Diversity Arrays Technology

Government

- » Alison Hemmings, National Enabling Technologies Strategy – Policy, DIISR
- » Nick Miller, National Industrial Chemical Notification & Assessment Scheme (NICNAS)
- » Peter Thygesen, Office of the Gene Technology Regulator (OGTR)
- » Craig Cormick, NETS – Public Awareness and Community Engagement, DIISR

General Public

- » Kathryn Spring
- » Russell Brooks
- » Georgina Ramsey
- » Kimberly Harding
- » Sheryll Reti
- » Tareq Hajjaj
- » Anya Pestonji
- » Swamy Narayan

Consumer Health, Trade Union and Public Interest Organisations

- » Margaret Stebbing, Public Health Association of Australia
- » Renata Musolino, Victorian Trades Hall Council
- » Georgia Miller, Friends of the Earth
- » Bob Phelps, Gene Ethics
- » Rachel Carey, MADGE (Mothers are Demystifying Genetic Engineering)

Organisation and support

- » Wendy Russell, NETS-PACE, DIISRTE
- » Craig Cormick, NETS-PACE, DIISRTE
- » Michael West, NETS, DIISRTE
- » Lisa Smith, Minds at Work (Facilitator)
- » Janet Salisbury, Biotext (Evaluator)
- » Julie Irish, Biotext (Note-taker)



Appendix B

Public engagement in science and technology – the international context

Enabling technologies have the potential to change the way we live by providing new approaches to healthcare, agriculture, the environment, communications and the economy. In doing so, they have the potential to provide a range of benefits but also a range of impacts and risks. While many individual technologies have been enthusiastically embraced by the general public, the increasing pace of discoveries and their commercialisation over the past few decades has been accompanied by rising concern. This has been further fuelled by health and safety controversies — such as toxic waste, bovine spongiform encephalopathy (BSE, or ‘mad cow’ disease) and the health effects of mobile phones — which have revealed the uncertainties inherent in scientific understanding and undermined public trust in scientists’ and policy makers’ claims of safety. Some emerging technologies also challenge our core values about who we are and how we want our society to be.

Over the past 20 years, public concern has led to increased efforts towards public engagement in decision making, particularly around public policy decisions, such as how emerging technologies like human cloning, embryo research, genetically modified organisms and nanotechnology should be used and regulated in society. Decisions about enabling technologies are complex, involving diverse and often competing objectives, interests and perspectives. There are multiple decision makers and stakeholders, including government, researchers, industry, special interest groups, community groups and the general public.

From public understanding to public engagement

As tensions around science and technology issues emerged in the 1980s and 1990s, governments allocated large-scale public spending to programs designed to increase science education and the public understanding of science (science centres, festivals, education programs, TV and radio shows, and media presentations of all kinds). This was associated with the emergence of a new profession of ‘science communicators’.

These initiatives were based on a ‘deficit’ model of science communication — a belief that public sympathy for science would be increased if people knew more about it. Despite all the activity, by 2000, public mistrust of science was deepening.

In 2000, the UK government commissioned the House of Lords Select Committee on Science and Technology to conduct an inquiry. The report of the inquiry, *Science and Society*, marked a turning point in science communication worldwide. A key finding was that educational activities were no longer enough to engage the more sceptical and less deferential public. The report recommended the need for a different approach — a dialogue, in which those seeking to promote science also listen to the concerns of the public, particularly when ethical questions arise.

Early shifts towards dialogue

From around 2000, there was a worldwide trend to incorporate more dialogue methods in public consultations for the development of science policy, especially for biotechnology issues such as genetically modified foods and embryo research. These public consultation activities used methods such as surveys, opinion polls, debates, public meetings, workshops, citizens’ juries and consensus conferences. Major initiatives included the *GM Nation?* public discussion in the United Kingdom; consultations on animal-to-human transplantation in Canada and Australia; discussions run by biotechnology and bioethics advisory councils in New Zealand; and consultations on the use of human genetic information, human cloning and embryo research in Australia. Evaluations of these activities started to provide a picture of what worked well and not so well, and the strategies needed to achieve better dialogue and citizen involvement.

Public engagement in nanotechnology

At the same time as interest in public engagement methods was increasing around the world, nanotechnology was emerging as the next important area of scientific research that would have wide-ranging social and environmental implications. This provided opportunities to build on the lessons learned from biotechnology and, from the early 2000s, there were numerous initiatives for public engagement with nanotechnology.

These initiatives were accompanied by increasing academic research on dialogue and other participatory procedures for public engagement in science and technology, as well as in other policy issues. There were also organisational initiatives, such as the CIPAST project, funded by the European Commission, which aimed to bring together organisations with experience in the use of participatory procedures for public engagement in science and technology issues, and different stakeholder groups, such as parliamentary offices, research institutes, science shops and science museums.

Moving public engagement ‘upstream’

An important observation from the earlier biotechnology public consultations was that public engagement needs to happen early enough to be able to affect the course of development of a new technology. This provides opportunities for people to contribute to setting the direction of the science (‘upstream’), rather than only being involved in policy making after the technology has been developed and commercialised (‘downstream’). Nanotechnology provided a perfect candidate for engaging with the public much earlier than had been the case for other biotechnologies, and upstream engagement was a major feature of events and activities from the mid-2000s.

Upstream engagement has a number of advantages:

- » It provides opportunities to align research and policy with public needs.
- » It allows science to be considered in a wider social context.
- » It overcomes negative preconceptions and allows the public to have more ownership of the technologies.
- » It encourages citizens to be active and scientifically aware.

However, experience has shown that it can be harder for the public to enter a discussion about an emerging technology if there are not yet concrete examples of how it will be used. This is often described as the ‘Collingridge dilemma’; that is, we cannot know the effects of a new technology on society until it is well developed and widely used, by which time it is too late to shape it effectively.

This dilemma is partly addressed by concepts of early public engagement such as constructive technology assessment (CTA). This process involves anticipating the future of the technology within its scientific and a social context. CTA involves genuine dialogue among a diverse group of interested parties and broadening what aspects of the technology are considered and which actors are involved.

Some public engagement researchers have suggested that, as technologies are developed and become better understood, open-ended, upstream engagement should give way to consideration of specific developments using the technology. In this way, the public could be engaged, and able to have an input, at all stages of technology assessment.

Broadening the context

Another feature of earlier public consultations on biotechnology was that they tended to focus on the technology rather than consider science issues in a social context, where the influence of social structures, goals and interests could be considered, and where feelings, values and fears could be expressed and included in the discussion. Maintaining a ‘technocratic’ focus for public engagement disadvantages the public by limiting their ability to participate and excluding their ownership of the technology. To engage on a more meaningful level, the focus of nanotechnology discussions from the mid-2000s broadened to promote mutual learning, using all types of knowledge and perspectives to understand the technology, including its uses and contexts, regulation, and innovation. Studies of broader context activities have found that people’s attitudes to technology are complex and include a number of concerns and uncertainties that need to be expressed and addressed. In this context, framing the issues to be neither too broad nor too narrow for effective public input is challenging.

Addressing knowledge imbalances

An important consideration for public engagement is how to have an equal dialogue in the face of vast differences in knowledge among the participants. This relates not only to scientific knowledge, but also to the equally valuable knowledge and perspectives of other academic disciplines, local communities, organisations and individuals. Providing high-quality information is essential to success, as well as to ensuring that different types of knowledge are equally valued. A common theme in many successful engagement activities is that participants feel great satisfaction when they progress from having little specific knowledge about the subject to discussing issues, making informed decisions and developing solutions to problems. Scientists have also expressed surprise and enjoyment at discussing the insights the general community has about their research.

Differentiating the public

Although public engagement is now accepted as an important part of responsible research, determining who 'the public' is can be problematic. Differences in age, gender, education, nationality and religious beliefs have profound effects on the outcomes of public engagement events. Some public engagement researchers have noted that the public is usually framed in one of three ways: as lay people needing education; as consumers who are encouraged to accept a range of future commodities; or as stakeholders in a careful consideration of the technology's risks and benefits. Each frame presents the technology in a different light and may limit the discussion and outcomes. These researchers advocate framing public engagement events in terms of the public as citizens. Citizens are empowered to shape the future of research and policy, and are active members of their communities who share their knowledge and act on behalf of others.

In our globally connected society, the internet has redefined the way we think about citizens and communities, and the web can be a powerful way to engage people anytime, anywhere. This is evidenced by the increasing number of blog entries relating to nanotechnology and other emerging technologies, and their debated benefits and harms. A key issue in this area is the quality of engagement using web-based tools, and how contributions and deliberations in this new domain compare with traditional methods.

Breaking out of an institutional framework

The organisation running an event can affect people's perceptions. Activities have been coordinated by universities, government agencies, research facilities, independent consultancies and think tanks — these can vary widely in their aims and concepts of engagement, which can mean the difference between a one-way reinforcement of pre-existing opinions and genuine, constructive dialogue.

The earlier public consultation events were usually based on a 'top-down' approach (where the activities were designed, organised and facilitated by powerful organisations) and this approach has continued to prevail in some countries, including Australia. Such activities rarely go beyond the short-term, structured exercises of the early 2000s (see above). Although a truly 'bottom-up' approach has not yet been developed, many more recent public engagement activities have moved towards this approach. There has also been an increasing number of informal initiatives that allow public dialogue in a relaxed and friendly atmosphere.

Web-based activities also provide a place for citizens to engage with each other in an open environment.

Analysts of these activities have stressed the importance of acknowledging participants' views and proposals, and maintaining transparency in the process. The aim of public engagement is to provide channels of communication between the public and the researchers or policy makers. If an intermediary organisation is involved, it needs to create these channels.

Conclusion

A common observation from many public engagement events on nanotechnology around the world is the participants' mixture of optimism and uncertainty.

People are excited by the potential social, health and economic benefits of nanotechnology, but they are worried about the risks, how the impacts will be managed and regulated, and by whom. Many studies show that people want to participate in open discussions about science and technology and contribute to policy making. Successful and meaningful public engagement in the future will be a truly collaborative effort that considers the changes that come with new technologies and their implications for everyone.

This is a summary of a literature review prepared by Biotext in October 2010.

The full review can be accessed through www.innovation.gov.au/STEP.





STEP

More information

about the STEP framework and STEP engagement activities
can be found at www.innovation.gov.au/STEP