

**Submission on the draft exposure legislation
and the explanatory memorandum on the
New Research and Development Tax Credit Scheme**

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1 SUBMISSION SUMMARY

The R&D Tax Credit Scheme as proposed in the exposure draft legislation and explanatory materials (EM) is impractical and too complex for SMEs, does not meet key policy objectives and fails to meet its stated objective.

This is demonstrated by applying the exposure legislation to the examples in the EM and to an energy efficiency project in the manufacturing sector. It was found that many of the tests and rules in the legislation are complex and it cannot be accurately determined what is eligible or ineligible,

Another finding of applying the legislation to these examples is that many R&D projects, and most activities and expenditure may not be eligible.

Thus is likely that the overall benefit of the R&D Tax Credit Scheme to industry may be about 20% compared to what the current R&D Tax Concession provides.

In addition, most of any benefit may be received two or more years after the expenditure occurred.

The reduction to about 20% will impact negatively on all industry sectors and key government policies such as achieving greenhouse gas mitigation targets, productivity improvements and the tax payer receiving an adequate return on the proposed \$43B NBN investment. Collectively, these negative impacts may have major and measurable economic consequences.

2 RECOMMENDATION

It is recommended that the exposure legislation be withdrawn for the reasons outlined above. Minor amendments will do little to address the fundamental problems and adding to the list of augmented feedstock quarantined items will increase complexity without resolving the fundamental problems.

It is recommended that a working group be formed to ensure that the replacement scheme is less complex, more predictable, SME friendly, achieves key policy objectives and is revenue neutral.

An observation is that the exposure legislation appears to have been released without adequate consultation with relevant Commonwealth departments or testing by SMEs who will make up the bulk of customers although only a relatively small fraction of revenue foregone.

3 THE R&D TAX CREDIT SCHEME IS FUNDAMENTALLY FLAWED

The scheme is fundamentally flawed for reasons that contribute to it not achieving its stated objective which is to conduct:

R&D activities that might otherwise not be conducted because of technical uncertainty, in cases where the knowledge gained is likely to spillover to the benefit of the wider Australian economy.

The first reason is that this new R&D Tax Credit Scheme focuses on the support of acquiring new knowledge and largely limits support to the “R” end of R&D. However, new knowledge does not directly result in spillover or in wealth generation. It is creating innovative new or improved products, processes, material, services (the “D” end of R&D) that apply new knowledge that results in spillover. Thus, focusing on the “R” end and drastically cutting the “D” end means that direct spillover will be minimal.

The second reason is that the new R&D Tax Credit Scheme is unlikely to fund R&D that would otherwise not be conducted. This is due to the operation of proposed augmented feedstock provisions delaying receipt of much of the benefit such as the refundable tax credit by several years. Also, the amount of the benefit will be determined by the outcome of the R&D project – more if it technically fails. This will result in the scheme having little influence on whether the R&D project proceeds or not or on the scale of the project. In other words, the new scheme may do little to encourage R&D that otherwise might not be conducted.

It is my observation that SMEs generally invest much of the current offset refund into performing subsequent R&D which otherwise would not be undertaken. Therefore R&D expenditure by SMEs is likely to be highly sensitive to the level of financial benefit. Drastically reducing and delaying the refund will hurt innovative SMEs.

A third reason why the proposed scheme is flawed is that it is complex, will involve greater compliance costs and SMEs will find it difficult to access. This contrast to the following statement by Ministers Swan and Carr on 18 December 2009:

“The draft legislation follows through on the Government’s commitment to deliver a more generous, more predictable, and less complex tax incentive by replacing the outdated and complicated R&D Tax Concession”.

4 THE MANY NEW HURDLES OF INDETERMINATE HEIGHT

There are many new eligibility tests and expenditure provisions in the proposed R&D Tax Credit Scheme that confront companies and they have been applied to the examples in the exposure explanatory memorandum (EM) and another example.

It was found that there is great uncertainty in applying some of the tests, the EM provides inadequate guidance, the examples fail to provide methodology useful to SMEs in applying the tests and there may be unintended consequences. Provisions like the augmented feedstock rules and compliance requirements including the need to separately identify core and supporting activities may add significantly to complexity and compliance costs.

Not only is the benefit reduced by about an 80%, but compliance cost may increase by a significant but unknown factor.

SMEs who conservatively self assess will be particularly discriminated against because the scope of some of the new tests like the “considerable novelty” test is very difficult to determine. They will therefore apply such tests narrowly since they cannot afford the cost and time of ATO audits, Ausindustry assessments and any tax penalties or expensive advice which is normally the domain of larger companies. Nor can they afford spending time

trying to understand complex tests or setting up complex systems for compliance. By taking the conservative approach will mean that little will qualify for the benefit and many who register for the existing R&D Tax Concession may cease to do so.

The following is a summation of complexities and difficulties of some of the new tests. This is based on a detailed analysis of the examples that are at parts 8 and 9 of this submission.

4.1 The “considerable novelty” test

This is clearly a tougher test than the current “appreciable novelty” test, but how much tougher is impossible to determine. This test represents a major hurdle for SMEs who self assess and may exclude many SME R&D projects.

Why this qualifying adjective has been chosen is not clear, but its use is probably best summed up by the following observation in Fowler’s Dictionary of Modern English Usage, Oxford University Press - *“Considerable is a flabby adjective, a favourite resource of flabby thinkers...”*

Details on problems applying this test are at 8.1, 8.2, 8.3, 8.6, 8.11, 8.15 and 9.1.

4.2 The requirement to satisfy both the “considerable novelty” AND high levels of technical risk test

Some projects involving a high level of technical risk may not also involve “considerable risk” that the AND test requires. An example is where a company undertakes experimental activities for the purpose of finding something new or achieving an innovative breakthrough but technically fails. The Smartread and Ecostirp examples may be used to illustrate this. Specifically, if C23 is not effective in reducing greenhouse gas emissions or no new compound that may result in improved tyres is identified in the Smartread example, then these projects appear to fail the considerable novelty test. In each case no “considerable novelty” is present and therefore “involved”. Based on a reading of these two examples, this may be an unintended consequence. There is more discussion on this issue at 8.1, 8.2, 8.15 and 9.1.

4.3 The dominant purpose test for supporting activities

This requires that the supporting activities are undertaken for the dominant purpose of supporting core activities. Several problems have been encountered in applying this test:

- No useful methodology is identified on how to apply this test in either the examples in the EM or where this issue is discussed in the EM. I have attempted to measure the various purposes of a supporting activity in the manufacturing example at 9.5, and this illustrates how complex this test will be to apply.
- Companies undertake R&D activities as a strategy to make money and profits by developing and commercializing products, processes etc and this is dependent on factors including the market need and size and the product being competitive in terms of performance, value and price. This typically encompasses the dominant purpose of the R&D activities that they undertake. To acquire new knowledge is most unlikely ever to be a significant purpose for an SME undertaking an R&D activity. This leads to problems in

applying the dominant purpose test and may result in activities unintentionally being excluded.

- the dominant purpose test may have other unintentional consequences. For example, if the project in the Boulevard Mining 1 example fails and the truss needs to be replaced with some other roofing system to make the mine safe, this activity would not be eligible. The dominant purpose would be mine safety, not supporting the core experimental activities.

There is more discussion on this test at 8.1, 8.3, 8.7, 8.9, 8.15 and 9.5.

4.4 The 18 excluded activities tests that apply to both core and supporting activities

Many of these tests are difficult to apply and it is unclear what they cover. The EM fails to provide adequate guidance. Some clearly discriminate against the ICT and manufacturing sectors. Most projects undertaken by the ICT sector will now be excluded.

One is that activities associated with complying with statutory requirements or standards are excluded. Many products need to comply with standards and statutory requirements and therefore projects to develop these products may be therefore excluded.

More discussion is at 8.1, 8.2, 8.3, 8.11 and 9.7 to 9.9.

4.5 The augmented feedstock rule

This rule requires that the market value of a feedstock output be deducted from the expenditure incurred on its production. This will have major impact on reducing the eligible expenditure and delaying receipt of the benefit. It will also reward failure – it is likely that the market value of most feedstock outputs can be reduced to zero or scrap value only following the technical failure of the project or a prototype is tested to destruction or a similar circumstance.

The only outputs excluded from this rule are conceptual design and new information and knowledge. Thus it is likely that the feedstock rule will apply to detailed engineering design, prototypes even when they are not intended for sale, pilot plant that may be used for some production, but is not economically viable, software code and less tangible items such as a new service. Market values will need to be determined even when these items are incomplete and at the time of the production of the feedstock output

Major problems will be determining the market values in many cases and complying with the rule. Adjustments may need to be made as the project progresses and market value changes. SMEs may be subject to penalties if the market value is underestimated. More analysis of this rule is at 8.3, 8.12 and 9.6.

4.6 The extended not at risk rule

Another rule in the draft R&D Tax confronting SMEs who undertake R&D projects as part of contracts is S355-405 that is entitled “expenditure not at risk”. This is a misnomer – there is no reference to expenditure not at risk within the S355-405. Instead, S355-405(1) uses the words “*had received, or could reasonably have expected to receive, consideration*

as a direct or indirect result of the expenditure being incurred” and requires the consideration be deducted from the expenditure incurred .

This is much broader than the current S73CA and the EM provides no guidance on what it is intended to cover S355-405 may apply even when there is risk of technical failure and therefore some chance of not receiving the consideration or substantial cost over runs occurring. Additionally, SMEs take on contracts that may be large in comparison to the company’s financial resources. Thus the company and the investments by the shareholders and directors may be at risk where it is necessary to undertake an R&D project that involves substantial technical risk in order to deliver the contract.

It is noted that SMEs who take on contracts are very important to improving productivity and providing extensive spillover benefits and this is discussed in more detail at 8.10,

5 IMPACT ON MANY SECTORS AND KEY POLICIES

The reduction in support for R&D and innovation by an estimated 80% will impact negatively on many key current Commonwealth policies and industry sectors. Their collective negative impact may add up to measurable and perhaps dire economic consequences.

5.1 Accelerated decline in the manufacturing industry

Just prior to the 2007 election, the Labor Party in its **Fresh Ideas For Australian Manufacturing** document stated:

There is a broad consensus that a focus on innovation is critical to the survival of manufacturing in Australia – both for revitalising mature industries and for the development of sunrise industries. Indeed, innovation is critical for competitiveness across all sectors of the economy. That is why Labor says that, in the 21st century, innovation policy is industry policy.

The Labor Government by introducing the R&D Tax Credit Scheme is now proposing a major cut in innovation support for the manufacturing sector. If the above statement is correct, then this cut has every likelihood of increasing the rate of decline in the manufacturing sector.

In addition, specific exclusion tests discriminate against the manufacture sector. This includes the exclusion of preproduction activities, activities associated with complying with standards, patent and licensing activities, quality control and market research. These exclusions will further impact on the viability of the Australian manufacturing sector.

5.2 Impact on greenhouse gas mitigation

It is demonstrated in part 10 of this submission that supporting the development and uptake of energy efficiency and renewable energy technologies is an important if not the most important strategy for greenhouse gas. It is also demonstrated that the introduction of the R&D Tax credit scheme will decelerate the development of these technologies and it is suggested that the economic cost resulting from this may exceed the \$1B+ savings resulting from replacing the existing scheme with the proposed R&D Tax Credit Scheme.

5.3 Impact on the software industry

This industry is deliberately discriminated against despite the Productivity Commission Report – Public Support for Science and Innovation, 2007 reporting that DCITA found that ICT R&D offered the highest spillover benefits out of 12 industry groups!

Spillovers benefits are likely to range from an internationally competitive financial sector that did not require a government bail-out during the global financial crisis to SMEs developing eHealth and eLearning systems that improve productivity. Software companies including my clients are already indicating that they will cut back on software R&D or carry out more in India.

5.4 Impact on the proposed \$43B National Broadband Network

The R&D Tax Credit Scheme will not support the development of new and novel internet services by Australian SMEs that have the potential to revolutionise healthcare, education, electricity, energy, public service and commerce and collectively, have major impact on productivity. Since R&D undertaken by SMEs is sensitive to the level of support, many of these services may not be developed if introduction of the R&D Tax Credit Scheme proceeds. This will diminish the value of this enormous \$43B investment and reduce the ROI for tax payers.

5.5 Reduced collaboration between research organisations/universities

“Universities and public research organisations provide knowledge to fuel the innovation system” (Powering Ideas Statement by Minister Carr, 2009)

Core technology expenditure will no longer be eligible expenditure after 1 July 2010 if the proposed R&D Tax Credit scheme proceeds. This combined with the likely 80% cut in the overall benefit and that projects involving knowledge transfer may not pass “considerable novelty” and “new knowledge” tests will reduce the transfer of knowledge from universities and public research organisations to Australian industry resulting in negative economic outcomes and not being in accord with Minister Carr’s policy as stated in 2009.

5.6 Limiting SMEs ability to contribute to economic growth and improving productivity

“Australia has relatively few large firms so it is especially important that we lift the innovation performance of smaller firms”. (Powering Ideas Statement by Minister Carr, 2009)

SMEs have and continue to make important contributions to economic growth and improving productivity. How SMEs make this contribution where they “innovate” on a contract-by-contract basis is covered in detail at 8.10.

However, the many complex and difficult rules in the R&D Tax Credit Scheme will result in this scheme being inaccessible for most and therefore this scheme is not in accord with Minister Carr’s policy. In fact the scheme will reduce, not lift the innovative performance of SMEs. The damage may be worse than this. Many innovative SME firms that

contribute to economic growth may disappear and the the valuable infrastructure that they provide may never be replaced.

6 COMPLIANCE ISSUES

6.1 Registration

Registration may be more complex since supporting activities may need to be identified and mapped to core activities and feedstock outputs will need to be identified

AusIndustry may have the power not to register activities. This is of concern since AusIndustry staff may not have the technical background to determine what is the “considerable novelty” or determining dominant purpose.

This also adds to the level of uncertainty for SMEs since they may not know for many months and perhaps up to a year whether an activity will be registered or not. Depending on administrative processes adopted, the payment of the refundable tax credit may be delayed by a corresponding period.

6.2 Determinations

It is understood that AusIndustry will offer a binding determination service. It is not known whether SMEs will have to pay for this service and AusIndustry is unable to indicate how long it will take to provide an answer. If AusIndustry needs to obtain expert technical advice and then refer the matter to an external committee, the time scale could be in the region of 3 to 6 months.

This may mean that R&D is delayed in some cases and market opportunities lost. That the determinations are binding may create considerable angst, particularly since many of the tests are far from black and white. The determination process will also add to compliance costs.

7 CLAWBACK OF R&D GRANTS MAY BE MORE HARSH

The clawback provisions foreshadowed at EM 3.97 to 3.99 that will apply when a company is fortunate to receive an R&D grant may be more harsh. This is illustrated in the example at part 11 of the submission for a SME with less than \$5M turnover that has tax losses. Thus is a fairly typical financial circumstance for a R&D grant recipient.

I have not had the calculations checked, but it would appear that the cash flow benefit of a grant in the example is 85% of grant for the current scheme but would only be 30% if the rules in the EM are applied.

EM 3.98 is incorrect – the current clawback provisions reduce the rate of deduction for the R&D Tax concession to 100% for double the amount of the grant where the grant rate is 50% of expenditure.

8 ANALYSIS OF EXAMPLES IN THE EM

This part of submission analyses the examples at EM 2.66 to EM 2.78 including the methodology applied in tests such as the “considerable novelty” test, the “dominant purpose” test for supporting activities and the augmented feedstock rules. How the various tests and expenditure provisions impact on the projects in the examples beyond that specifically covered in the examples is also examined.

8.1 Example 2.4 Ecostrp

The example covers only the “R” part of R&D, specifically experiments that involve measuring exhaust emissions for a variety of engines and petrol octanes while varying the amounts of C23. It is not indicated whether C23 is effective in reducing greenhouse gas emissions.

The “considerable novelty test”

The case for the core activities is addressed only to the extent that C23 has not previously used as a fuel additive and that the outcome could not be predicted since the chemistry of C23 is “underdeveloped”. No methodology is applied on how to determine whether “considerable novelty is involved”, eg the next obvious step test and taking into account spillover benefits that are referred to in EM 2.22.

What appears to be applied is a test for “novelty” that is outlined in EM 2.21, not a tougher or higher degree of novelty test that EM 2.22 indicates is required and results from the use of the adjective “considerable”. This leaves the reader in an even more confused state on what is meant by the requirement that core activities are required to involve “considerable novelty”.

It is acknowledged that, if it is found by undertaking the experiments that C23 offers reductions in greenhouse gas emissions, then the project may involve “considerable novelty”. But what if the project fails, ie C23 does not result in any reduction in greenhouse gas emissions? In this case, the core activities may fail the novelty test suggested in EM2.21 since a new use of C23 does not result. If the core activities fail the novelty test, then they also fail the tougher “considerable novelty” test!

Dominant purpose test for supporting activities

No supporting activities are identified and this diminishes the value of this part of the example. The reason identified why these unidentified supporting activities are eligible is that that Ecostrp is not currently involved in production. Does this mean that supporting activities are always eligible supporting activities if a company is not involved in production at the time the project is performed and the activities are not excluded activities? If so why not state this as a paragraph in the EM!

Achieving the project technical objectives

If experiments identify that C23 has potential for reducing greenhouse emissions, then it is likely that the project would need to continue since the experiments do not prove that C23 can substitute for K23. For example, substantial trials and other activities will be needed achieve the technical objectives including demonstrating fuel savings in operational

conditions, that C23 does not harm engines or cause other problems and meets environmental and other standards.

These additional activities may be excluded by applying the dominant purpose and excluded activities tests – the trials and other activities maybe pre-production activities since a purpose will be to demonstrate commercial viability, and they may be associated with standards compliance.

Patent protection will be required for Ecostrap to position itself to raise venture capital that may be needed to fund the substantial trials. With out patent protection, the “invention” could be readily copied and it would not be worthwhile for Ecostarp to continue the project and investors would not be interested. However the excluded activities now exclude patent protection activities, even if the “dominant” purpose is to obtain the funds needed to continue undertaking “core activities”.

Thus, the proposed R&D Tax Credit Scheme is likely to support only a small portion of the R&D necessary to achieve the technical objectives of the project and also only a small portion of that classified as R&D by the Frascati Manual definition.

8.2 Example 2.5 Smartread

In this example, Smartead undertakes a research program for the purpose of testing new compounds with the view of “developing improved products”, (presumably tyres) but does not indicate that any compounds that have the potential to result in an improved tyre.

Considerable novelty test

On the basis that no promising compound is identified, no “considerable novelty” may be involved for reasons outlined in the previous example. Only if a promising compound is identified is the project likely involve “considerable novelty and be eligible!

Possible Second Project

Should a promising compound be identified and Smartread proceeds with a second project to develop the an improved tyre based on this compound, it is likely that this second project would be much more expensive, but most of its activities and expenditure may be ineligible for reasons such as failing the dominant purpose or excluded activities tests. These activities may be preproduction activities or associated with standards compliance tests and some of remaining eligible expenditure maybe caught by the augmented feedstock provisions.

8.3 Example 2.6 Boulevard Mining I (BM)

The “considerable novelty” test

This example applies the “considerable novelty” test without making any reference to the qualifying adjective “considerable” and this will be analysed first. The example states:

“the application is a novel, rather than obvious, extension of previous uses”

This is the rationale why the “considerable novelty” test is satisfied. Does this mean that an application need only be novel to satisfy the “considerable novelty” test? If so, why include

the qualifying adjective “considerable” in the legislation? This is the first area of confusion in this example

The second area of confusion is that the example appears to imply that if the application is novel, then it is not obvious. But this is the opposite to how these terms are used in Patent Law. An invention as defined in a claim may be novel, but it can still be judged to be obvious.

EM 2.22 identifies the next obvious step (or obviousness) and the spillover test as relevant for applying the “considerable novelty” test. The obviousness test may be impractical for SMEs since they may need to obtain evidence of technical experts to demonstrate compliance and it may prove difficult to reconstruct the state of knowledge at the moment before the technical step.

As noted, EM 2.21 suggests a spillover test, but in this case, spillover benefits are unlikely. In fact, negative spillover may result since burning coal results in greenhouse gas emissions and Boulevard Mining is not required to disclose the new knowledge that results and is unlikely to do so. In this and all other examples, the spillover test is ignored!

Dominant purpose test for supporting activities

In this example, only the removal of coal activity to produce the “experimental tunnel” that would otherwise block the main tunnel is considered and is found to be ineligible for the reason that this coal *“is mixed with a much greater amount from the main tunnel fork.”*

No methodology in this example is developed and applied. For example it would be reasonable to expect that all purposes of the activity to be listed and then the purposes ranked using some criteria. However this is not done. All that is done is producing a reason which relates to how the coal may be transported, ie with other coal. It may be that the removing the bulk coal may indeed be an expensive operation since it may not part of the normal production process and therefore a more detailed analysis and the application of sound methodology may result in a different view. This example only creates additional confusion on how to apply the dominant purpose test for supporting activities.

The project will also involve the conceptual design, detailed engineering design, construction, transport and installation of the truss in the tunnel, possible modifications based on feedback from the experimentation and dismantling if the project is unsuccessful. The truss may form part of the tunnel support during subsequent mining of the coal seam if the project is successful in achieving the technical objectives.

At least some of these activities are supporting activities, but there is no discussion in the example on how to determine which are core and which are supporting activities or how to go about determining the dominant purpose of the supporting activities.

The problems in determining the dominant purpose of supporting activities may be complicated by the purpose of core activities being to acquiring new information and knowledge which is seldom the dominant of any R&D activities performed by the private sector. The dominant purpose is nearly always commercial and this impacts, at least, *prima facie*, on applying the dominant purpose test.

An example of this is in the event of technical failure that may leave the mine in a dangerous situation. In this circumstance, the truss may need to be removed and replaced with an alternative roofing system. In this case, although the dangerous condition results solely from undertaking the core activities, the dominant purpose of the truss removal etc is to address the dangerous situation therefore enable mining to continue and therefore this activity being ineligible

The dominant purpose test may therefore result in activities to remove a now redundant pilot plant or remediate the environment at the end of an R&D project not being eligible. This demonstrates the dominant purpose test may result in unintended outcomes.

Augmented feedstock issues

The example is limited to coal removed in the “fine coal extraction activity” and quarantining of the conceptual design. Other outputs would be the installed truss, its detailed engineering design and presumably the tunnel around the truss. No guidance whatever is provided on applying the augmented feedstock rules to these feedstock outputs and how to determine the market value of these outputs!

It is noted that the market value of these outputs would be zero in the event of technical failure and probably at least their cost value if the project succeeds. Thus the benefit may be minimal in the event of technical success. The catch 22 is that, if technical failure occurs, then “considerable novelty” may not be involved, the project is not eligible thus leading to zero eligible expenditure!

Other issues – excluded activities

All or some of the activities may be excluded since they may be considered to be preproduction activities or associated with mining safety statutory regulations, but these issues are not considered.

8.4 Example 2.7 Boulevard Mining II

This example fails to develop the case why the project involves either “considerable novelty” or a high level of technical risk.

8.5 Example 2.8 Mimic Mining (MM)

The eligibility of the project may depend on how Mimic “learns of” it, for example by way of a third hand un-substantiated rumour or as a consequence of BM disclosing details of the technology.

In the event of BM disclosing the details, the MM project is unlikely to satisfy the requirements of the current definitions of innovation and technical risk.

This example also fails to develop the case why the project does not involve either “considerable novelty” or a high level of technical risk.

8.6 Example 2.7 Boulevard Mining III

The “considerable novelty” test

This example also fails to adequately develop a case why this project involves “considerable novelty”. For example if the truss has been successfully applied by BM where the coal is not crumbly, why would it not be an obvious next step by a BM mining engineer to at least undertake a project to ascertain whether it can be applied in crumbly coal environment.

8.7 Example 2.10 Boulevard Mining IV

Dominant purpose test for supporting activities

This example fails to develop methodology that SMEs could apply in determining dominant purpose. The example could have also been used to analyse whether infrastructure built only to a minimum standard to enable the experiments to proceed would satisfy the dominant purpose test.

The following is noted

- at least some of the infrastructure would not be eligible under the current legislation.
- the infrastructure activities are likely to be preproduction activities and therefore ineligible
- all or most infrastructure would be captured by the augmented feedstock rules. The example refers to apportionment, but this is not part of the exposure draft legislation where only conceptual design is quarantined.

It is noted that the infrastructure development could be regarded as a preproduction activity and therefore ineligible for this reason..

8.8 Example 2.11 Groundheap Mining I

An observation is that it is unlikely such a project would be carried out at an abandoned minesite. Equipment would need to be shifted to replicate what happens at an operating minesite and the cost of this would cancel out any benefit.

8.9 Example 2.12 Groundheap Mining II

This example illustrates the very narrow scope of a core activity - it is limited to the experiment only.

The dominant purpose test for supporting activities.

This exposes the difficulty in applying the test. In this case, the activity of removing of certain overburden for the purpose of performing the experiments is determined not to be a supporting activity for the reason that “*the overburden would be removed regardless of the experiments*” and thus its “*the dominant purpose of removing the overburden is to access mineral deposit*”. However, this is also the dominant purpose of the purpose of the project including the core activities – to maximize the removal overburden and therefore increase the return on investment.

This example fails to provide any methodology where all activities have a common end purpose and how this should be taken into account to determine dominant purpose.

8.10 Importance of SMEs to mining & other sectors & the not at risk issue

The more likely scenario is that mining companies will collaborate with SMEs who specialise in providing products, systems and services to this industry sector. This may include mine roof systems and equipment and services of the Groundheap type. This is instead of mining companies developing technology in-house.

Collectively, these products, systems and services are important to the mining sector achieving high levels of productivity and contributing to knowledge spillover within the sector. The mechanism typically involves the SME winning a contract that will require the SME undertaking significant a R&D project in order to meet the requirements of the contract. The contract is normally fixed price and therefore the SME will bear the financial risk including not being paid if it is unable to meet the contract requirements. Even if the SME successfully meets the contract requirements, significant cost overruns are likely due the technical risk involved.

The SME will own any the resultant IP and will provide similar products, systems and services to other mining companies. This results in considerable knowledge spillover within the industry.

In the truss roofing system examples a likely scenario is the an SME who specializes in mine roofing systems and is already working closely with BM would provide the truss and be involved in testing of the in situ truss. If the project is technically successful, it is likely that the SME would provide similar systems and services to MM and other coal miners.

The result is knowledge spillover within the mining sector. Another benefit is that MM and others do not have to repeat the R&D project to acquire the know-how thus saving this expense resulting in improved productivity for this reason. A third spillover benefit is that the SME would be likely to be exporting its services thus resulting in export income for Australia.

Based on what I have observed, there are likely to be 100's of SMEs in Australia providing innovative products, systems and services in a similar manner to all economic sectors including to the manufacturing and health sectors thus making a major contribution to improving productivity.

For example, I am aware of companies providing innovative software systems for managing hospitals, clinical data, and eHealth. These systems are making significant contributions to improving health care services and achieving improved productivity. The R&D needed to develop these innovative systems is performed as part of contracts with cash strapped area and state health services and private hospitals around Australia. The systems thus developed are intended for multiple sale to health service providers in Australia and overseas.

Currently, these SMEs are able to claim the R&D Tax Concession benefit for the R&D project involved. However little if any expenditure will be eligible under the proposed R&D Tax Credit. Eligibility of projects, activities and expenditure will be subjected to difficult and complex tests - the "considerable novelty test" the "dominant purpose test for supporting activities", the many excluded activities tests, augmented feedstock rules to name some. In addition, it is not clear that software developed on a contract by contract basis where at least some of the code is reused complies with the new multiple software sale

test or is eligible under the new software services exclusion test. In any case, the augmented feedstock rules will result in most expenditure being excluded since software coding, services and prototypes feedstock outputs will have market value.

Another new rule in the draft R&D Tax Credit Scheme confronting SMEs who undertake R&D projects as part of contracts is S355-405 entitled “expenditure not at risk”. This is a misnomer – there is no reference to expenditure not at risk within the S355-405. Instead, S355-405(1) uses the words “*had received, or could reasonably have expected to receive, consideration as a direct or indirect result of the expenditure being incurred*” and requires the consideration be deducted from the expenditure incurred .

This is much broader than the current S73CA and the EM provides no guidance on what it is intended to cover S355-405 may apply even when there is risk of technical failure and therefore not receiving any consideration or substantial cost over runs. Additionally SMEs take on contracts that may be large in comparison the company’s financial resources. Thus the company and the investments by the shareholders and directors may be at risk.

The current R&D tax concession benefits including offset payments is often of critical importance to such SMEs maintaining cash flow, successfully completing the projects and providing their clients with the technologies needed to improve productivity and provide other spillover benefits.

The introduction of the R&D Tax Credit Scheme is likely to end this benefit in virtually all cases and result in a decline in the capability of these SMEs thus reducing the infrastructure needed to improve productivity across the Australian economy.

8.11 Examples 2.13& 2.14 Matryoshkoala I & II

These example creates further confusion and uncertainty on how high the bars are for the various tests/hurdles. Specifically:

- 2.13 may not satisfy a PKI test, The example determines that it does, but the example indicates that the project involves only an application of existing technology. In earlier examples, and elsewhere in the draft legislation and EM, the bar is set at a higher level than this.
- it is not clear why the “considerable novelty” test is satisfied. Would it not be obvious to an appropriate expert to test various fast drying resins as they become available.
- in example 2.14, testing whether the resin will block the long ducts is considered to be a trial run and therefore a not an excluded preproduction activity for the reason that “it is an experiment that needs to be run at full scale, rather than a trial or ‘shake down’ run for an activity close to entering a production phase.” However, it is noted that the legislation excludes preproduction activities even when they are core and thus experimental. The EM provides no guidance on what is meant by pre-production and it is likely that the dictionary meaning of pre-production would be an activity close or immediately preceding production. This example illustrates how difficult it will be for SMEs to apply this test in practice.
- since the products are toys for small children (the example proposes donating prototypes to a preschool), the products will probably need to comply with statutory requirements. This would be a project objective and a technical unknown and an activity to determine that the resin is child safe may be most expensive part of the R&D project.

However, any activities associated with complying with statutory regulation or standard are ineligible.

8.12 Example 2.15 Tabby Marine I

This example focuses on the feedstock rule and illustrates how complex it will be to administer. For example, if the rudder-screw assembly is not scrapped, but used for subsequent R&D, its market value will need to be determined. If it is then subsequently scrapped, adjustments are then necessary. The example also refers to quarantined and non-quarantined expenditure, profit margins and contingencies.

It is noted that no boat costs except the rudder-screw assembly costs are likely to be eligible despite the boat being used for period for R&D purposes. Tabby will need to finance the construction of the boat and this may severely impact on Tabby's cash flow and interest may be payable on resulting debts. Tabby will be out of pocket for this reason.

The other negative impact is that the market value of the rudder-screw assembly including its detailed engineering design will need to be deducted from eligible expenditure. This means that R&D Tax Credit Scheme will provide little if any benefit in the period the project is conducted. It could be that interest on the boat and rudder screw assembly may cancel out any benefit received during the period of the project. A further negative feature of the R&D Tax Credit Scheme is that interest incurred as a result of financing a R&D project is no longer deductible.

The likely outcome is that Tabby Marine would not proceed with the project and the lack of government support may contribute to it moving its boat building operation offshore.

8.13 Examples 2.16 Tabby Marine II

This example further indicates the complexities the augmented feedstock rule. It is noted that, when large capital items are involved, interest costs may negate any benefit after the application of the feedstock rule.

8.14 Examples 2.17 Tabby Marine III

This example appears to inadequately apply the "considerable novelty" test. For example, why is applying the assembly to a mono-hull not a next obvious step. In view of the technical failure, the outcome may not represent a "considerable novelty".

It is noted that the luxury fit-out including gold plated fittings may not be eligible under the current R&D Tax Concession legislation.

8.15 Examples 2.18 Whist Constructions

The complexities of the augmented feedstock rule are again noted and the Not at Risk S355-405 provisions are likely to apply. Also

- "Considerable novelty" may not be involved, particularly if technical failure occurs.
- The project may not be eligible since the activities are likely to be excluded activities since statutory requirements will need to be met.

In view of the dominant purpose test limiting supporting activities to only a small portion of the total bridge cost, the benefit in the event of technical failure would be small and very little bridge expenditure underwritten. In view of this, Whist Constructions probably would not tender in view of the risk involved and the government agency funding the bridge would be restricted to the more expensive conventional options.

9 MANUFACTURING SECTOR EXAMPLE

The following fictional example analyses how the proposed R&D Tax Credit Scheme may impact on what is eligible for support in respect to a project in the manufacturing sector that improves energy efficiency.

XY proposes to develop aluminium trailers for the Australian heavy trucking industry. Several other Australian manufacturers have produced aluminium trailers but they have technically failed due to metal fatigue problems. The technical objectives are that the trailers have a service life of 1,000,000 kms on all road conditions and are 3.5 tonnes lighter than equivalent steel trailers.

If the technical objectives are achieved and the trailers are broadly adopted by the Australian heavy trucking industry, major spillover benefits that may result include:

- greenhouse gas mitigation exceeding one million tonnes of CO₂ equivalents per year in Australia plus several times this amount overseas since it is planned to export the trailers to Asia, Africa and Europe and license the technology in the US.
- reduced operating costs for truck operators by up to 10%. Some of these savings may be passed onto consumers and businesses in remote locations in Australia.
- substantial export potential – the trailers can be shipped at low cost to Asia and Europe in car ferries that are used to import new cars into Australia and currently return empty.
- reduced maintenance of Australian roads which will save taxpayers many \$M's per year.
- reduced heavy truck traffic since, in certain circumstances, 9 rigs with aluminium trailers will be able to transport the same load as 10 rigs with steel trailers
- successful commercialisation will result in the employment of several hundred staff in a location in Australia where unemployment rates are high.

XY has identified a design that XY believes will overcome the metal fatigue problems and achieve the weight saving objective. This design employs a combination of known engineering concepts. One prototype has been produced and tested and has partly proven the technical feasibility. This trailer has traveled only 100,000 kms. While service life on the many different road and load conditions encountered in Australia remains unknown, XY has identified a number of design improvements following the construction and testing of this trailer that will be applied in the project.

The project involves:

- 1) Detailed engineering design involving FEA.
- 2) Construction of 10 prototype trailers. This includes the production of tooling including expensive dies for extruding aluminum sections. This tooling is required to produce the 10 trailers and some or all may be used subsequently in production.

- 3) Trial of the trailers by a major trucking company ZZ in most operating conditions likely to be encountered in Australia. The trial involves fitting data logging equipment that will measure stress and loading and regular checking of the trailers by XY's technical staff. ZZ are indicating that they may purchase up to 500 trailers if the trial is successful and if the trailer meets Australian standards. The data measuring and logging system involves the development of the computer software for this purpose.
- 4) The trial is set to end when the trailers have traveled 1,000,000 kms. The trailers will be then stripped and components examined for metal fatigue and the data analysed. This feedback is likely to be used to further improve trailer design. The aluminium will be sold as scrap.

The cost of producing the prototype trailers is \$100,000 per unit. An additional \$200,000 is to be spent on tooling and \$500,000 on the detailed engineering design. Manufacturing cost will need to be subsequently reduced to about \$50,000 since the market price will need to be \$80,000 or less for the trailer to be competitive in the market place. The scrap value of the trailers is \$10,000 per unit.

It is proposed to achieve the reduction in manufacturing cost by volume production on a production line and undertaking a second R&D to develop improved manufacturing processes and plant that includes overcoming a technical problem being encountered in the manufacture of a major key component that is resulting in a high rejection rate. The 500 unit order should enable XY to raise at least some of the capital needed to establish the efficient manufacturing plant.

An additional fact is that aluminium trailers are being produced in Europe and the US, but are of a different design, are for carrying lighter loads (Australian regulations mean that heavier loads can be transported) and it has not been demonstrated that they will have the required service life in Australian operating conditions including rough outback roads.

Some of the hurdles and barriers that XY will face in claiming a refundable R&D Tax Credit Benefit are:

9.1 The considerable novelty test

The question to answer is whether the project involve "considerable novelty" noting the existing engineering concepts are being applied? The first issue is to try to determine how high the bar is set by this test.

"Considerable" is a rough measure of how much and based on a dictionary meaning of "considerable" it possibly could mean 'a lot of' or "above average" novelty. If novelty is aligned with novel as used in Patent Law, it may be the case that something being patentable does not mean it involves "considerable novelty".

It is noted that the phrase "considerable novelty" may not be sound English for the following reasons:

- The usage of "considerable" is not considered to be acceptable English by some - Fowler's Dictionary of Modern English Usage, Oxford University Press, makes the observation - *"Considerable is a flabby adjective, a favourite resource of flabby thinkers..."*

- The likely dictionary meaning of “novelty” is “new occurrence” and therefore combining it with an adjective which is a rough measure of “how much” may be nonsense English.

EM* 2.21 defines “considerable novelty” as – *“it is this higher degree of contribution to knowledge that is likely to produce spillover benefits that would not arise from merely being the first to take the next obvious step”*. This definition is not part of the draft legislation.

EM 2.21 is recommending an obvious test, but applying this has problems. Specifically:

- the first problem is to whom was it the next obvious step - an unimaginative person skilled in the art, an imaginative person who is a world leader in that field of technology, a public servant who has minimal or no background knowledge of the technology and is to assess the eligibility of the project and its activities?
- the second is that novelty may appear obvious in hindsight - it is well known that anyone can be wise after the event, but whether it was obvious at a time immediately preceding the project is another matter.

EM 2.21 also suggests that the level of spillover benefits may also be relevant to determining whether “considerable novelty” is involved.

Thus SMEs are confronted with a test which appears at face value to be almost impossible to apply.

In respect to the trailer project, the argument against “considerable novelty” being involved is that the project may merely involve a combination of known design concepts.

The argument for is that if the project is technically successful, then the outcome would represent a “considerable new occurrence”. The additional evidence for this is the extensive spillover benefits that the successful technical outcome has the potential to generate.

A further issue in applying this test is the dictionary meaning of “involve” which is to *“to include or contain as a necessary part”*. Therefore, the project must include “considerable novelty”. It may not be sufficient that the intention is to include “considerable novelty” by achieving a technical breakthrough as the project progresses. If this does not occur and the project is a technical failure, the “considerable novelty” test may not be met.

Thus it could be that if the project is technically successful, the considerable novelty test is met, but the project will fail this test if the technical objective is not achieved.

9.2 The high level of technical risk test

Does the project involve high level of technical risk involved? Probably yes. Reasons to support this is that there is a real chance of technical failure or expensive design modifications being needed and an experimental approach is both required and being applied.

9.3 Requirement to identify which activities are core and which are supporting

Which activities are experimental and therefore core activities? It is likely that activities 3 and 4 are experimental processes and activity 1 has experimental content for the reason that it involves FEA which is a simulated or computer based experimental process. There is

uncertainty - should activity 1 be classified as “core activity” or is it a blended activity and needs to be divided into smaller components?

9.4 Purpose of acquiring new knowledge test.

Is the project being undertaken for the purpose of acquiring new knowledge? This project may not pass this test in view of what has been achieved overseas and that the design is based on known engineering design concepts. Although considerable know-how is created, EM 2.28 states that the creation of know-how within a company is insufficient to pass this test. On the other hand it could be argued that the know-how is different to the know-how used in producing aluminum trailers in the US and Europe since the trailer design differs substantially compared to that in existing trailers.

The issue is what is “new knowledge”? The dictionary meaning of “knowledge” is broad – *“the facts, or experience known by a person or a group of persons”*. Based on this dictionary meaning, the project and specifically activities 1, 3 and 4 involve acquiring new knowledge.

The issue then is - “is it the purpose”. The answer probably is yes. An issue is whether the government is attempting to set a “high bar” than is not warranted by the dictionary meaning thus confusing and creating uncertainty for SME registrants.

9.5 Does activity 3 pass the dominant purpose test for supporting activities?

The first step is to gain some understanding on how to apply this test.

EM 2.37 refers to a the prevailing or most influential test and that it being necessary to undertake a “supporting activity” to enable a “core activity” to be undertaken is **insufficient** to establish that “supporting activity” passes this test. (EM 2.38). The likely relevant dictionary meaning of dominant is “primary” and purpose is the “reason why something is done”.

The first logical step may be to list the purposes and then rank using criteria such as the influential test referred to in the EM. A list of the possible purposes for undertaking activity 2 may include (in no particular order):

- (1) winning the contract to produce 500 trailers
- (2) creating an improved trailer
- (3) supporting core activities that are conducted for the purpose of acquiring new knowledge that is about creating an improved trailer
- (4) designing the trailer and obtaining data needed to meet Australian standards
- (5) demonstrating the technical and commercial viability of the trailer
- (5) to raise the additional funds for commercialisation
- (6) winning other contracts
- (7) generating profits and growing the company.

An issue is that the technical purpose that the project is being undertaken is to “create” a new trailer that achieves the technical objectives and the key commercial purpose is to win the contract. These are the purposes of all the activities that form this project. It is also necessary to complete activity 1 to undertake activity 2 and complete activity 2 to commence activity 3 and so on.

Probably the most influential reason in this case is that the project may lead to winning the contract. There are probably similar reasons for almost all other R&D projects being undertaken (and the activities that form such projects) – companies undertake R&D as a strategy to make money by developing and commercializing products, processes etc and this is dependent on factors including the market need and size and the product being competitive in terms of performance, value and price. Such issues will determine what is the dominant purpose of the project and the activities that make up the project.

Companies do not undertake R&D including so called core activities for the purpose of acquiring new information or knowledge which is the required purpose in the definition of core activities. Thus, there is conflict between how business works and what the legislation requires. This results in (my opinion) the dominant purpose test being impractical and potentially creating uncertainties for SMEs.

In the current case, it is likely that the application of the current test would result in winning the contract being the dominant purpose for undertaking activity 2.

9.6 Augmented feedstock rules

Even if this project passes tests 1 to 5, it is likely that the application of the augmented feedstock rule will apply to nearly all expenditure. For example:

- The detailed engineering design probably would not be considered to be a conceptual design and therefore is feedstock output. It is likely that the ATO would consider the market value of the design to be its cost (EM 2.50) and therefore XY would gain no R&D Tax Credit benefit for this activity, at least in the year of its production. This is another area of uncertainty – what is meant by conceptual design which is the only current quarantined activity?
- The prototype trailers are feedstock output and their market value for the purposes of the test is their value at the time of production, (\$355-450,(1),Step 1) not their market value (in this case, scrap value) when the trailers have been tested to the end of their service life at the end of the project which will occur in a subsequent financial year. It is likely that the ATO would consider their market to be the cost of production, ie \$100,000 XY may argue that the market value would be at most \$80,000 and only if the technical viability of the trailers were demonstrated. This represents an area of considerable uncertainty. In addition:
 - The tooling including expensive dies would also be considered to have market value likely to be their cost of production.
 - Even expenditure items like producing a data logging system would be considered to be feedstock output.
 - It is noted that the above two items may be ineligible for other reasons.

Even if XY's turnover is below \$20M and is eligible to refundable tax credits, XY will receive little cash flow benefit during the period of the project for the following reasons:

- Even though it is the intention to trial the trailers through to the end of their working life, their market value will apply for the purpose of the augmented feedstock provisions until they are dismantled and scrapped and this is scheduled to occur at the completion of the project.

- The detailed engineering design will be the subject of an augmented feedstock market valuation and this valuation can only be adjusted to zero if the project is declared a technical failure.
- These 2 items are likely to represent the main areas of expenditure, but XY will be unable to gain a refundable R&D Tax Credit benefit until well after the project completion.

It is noted that there is discussion in the EM about quarantining additional types of expenditure, but this will only add to the complexity and uncertainty for SMEs in complying and possible unintended consequences.

9.7 Excluded activities – activities associated with complying with standards etc

The excluded activities that will apply to both core and supporting activities includes:

“activities associated with complying with statutory requirements or standards, including...” (S355-35(2)(l))

Based on the dictionary meaning of “associated” being “linked to” or ‘connected”, most if not all of the projects activities would be ineligible since a purpose would be to ensure that the trailer complies with Australian design standards.

Legal interpretation may narrow the scope of this subsection by analyzing what is specified in the words following “including” and taking into account that the legislation is beneficial and should be interpreted narrowly, but this involves obtaining complex and expensive legal advice that should not confront SMEs.

It is noted Phase 1, II and III clinical trails currently eligible may be excluded which will be of concern to the pharmaceutical and medical sectors.

This is an example where extending exclusions will create complexity, uncertainty, may considerably raise the bar and may discriminate against the manufacturing sector where complying with statutory requirements or standards is nearly always a factor.

9.8 Excluded activities – preproduction activities

Activity 2 (and possibly 1, 3 and 4) may be a preproduction activity and therefore ineligible. It is probable that the construction of the 10 prototypes would be considered as a trial production run and the production of the dies and tooling be considered to be “tooling up”. It is also likely that activity 2 to 4 could possibly be considered to be “demonstrating commercial viability” since it could be argued that this is “a purpose” of the trials. At least activity 2 appears ineligible.

9.9 Excluded activities – software developed for in-house use

Developing software is now excluded, except where it is *“for the purpose of making a commercial return directly from the supply of that software to 2 or more entities ...”*. This results in the software developed for the data collection and logging system and its sole purpose being for undertaking the project’s experimental activities is nevertheless excluded.

9.10 Not at risk rules

If there was a contract between ZZ that included payment for the 10 prototype trailers, then the payment amount would need to be deducted from eligible deductible expenditure. Even if the contract included performance clauses that means the payment needs to be refunded in the event of the clauses not being met, the payment amount may still need to be deducted from the eligible expenditure. Another scenario is ZZ, as a good corporate citizen, providing funds without any conditions. This still may be assessed by the ATO as a consideration since ZZ may gain a commercial advantage by first access to the production trailers or even the prototype trailers potentially providing a commercial advantage and return . Again the eligible deductible expenditure may need to be reduced by the amount of the funds provided by ZZ.

It is noted that the new not at risk provisions may be much broader than the existing S73CA provisions and the draft EM does not provide any guidance. This is another area of uncertainty and a barrier for SMEs.

9.11 Manufacturing Example Summary

Most expenditure is eligible for R&D Tax Concession benefits, but the proposed R&D Tax Credit scheme as proposed may provide minimal support.

It is also likely that little if any of the follow-on project to develop improved manufacturing processes and plant will be eligible for support from the R&D Tax Credit Scheme despite this being needed to achieve the level of productivity for the product to be manufactured in Australia.

10 Climate Change Case For Not Introducing The Proposed R&D Tax Credit Scheme

Australia currently faces its greatest technical challenge ever. **The Prime Minister of Australia announced at the Bali conference that by 2050 Australia would reduce emissions by 60 per cent over 2000 levels.** In the same period the population of Australia is now forecast to almost double. Therefore greenhouse gas emissions per person will need to be reduced to about 20% of their current level, ie from about 27 tonnes to between 5 and 6 tonnes of CO₂ equivalents per person.

I do not believe that the enormity of this technical challenge has sunk in – I have not seen the need to reduce greenhouse gas emissions to about 20% per person published or otherwise stated in public. The Garnaut Report Climate Change Report, 2008 does not consider the impact of the forecast population increase.

In order to achieve such a radical reduction in greenhouse gas emissions, major technological change will needed in every thing we do and use and we need an effective strategy to achieve this. The move to total zero emission electricity will be far from sufficient to achieve an 80% per person reduction since electricity production results in less than 50% of Australia's current greenhouse gas emissions. Even achieving interim targets of say 30% by 2030 will be economically very costly and probably politically unacceptable unless we optimize the strategy .

In an effective strategy for achieving the very substantial reductions in greenhouse gas emissions, we cannot afford to put all our eggs in one or two baskets. Sequestration of carbon dioxide produced in coal and even gas fired power stations is unlikely to be a viable option until at least 2030. Even then, it may prove to be too expensive due to the technical challenges involved. Generation of electricity using deep geothermal heat similarly will take a long time to develop and

may not be economically viable. Providing vast amounts of tax payer's money by means of grants to develop these technologies may be money down the drain.

A carbon tax or an ETS as the prime or "dominant" policy for achieving targets policy is a brute force policy which will be economically expensive and may be doomed to failure since it may become politically unacceptable. Already we are seeing signs of this happening. This will then leave us with no effective strategy and may lead to the many forecast environmentally disasters.

Many experts are now indicating that research and development is a key part of an effective strategy. For example, Isabel Galiana and Christopher Green of McGill University in their paper *An Analysis of a Technology-led Climate Policy as a Response to Climate Change* presented at the C0penhagen Consensus on Climate, 2009 state

It is the technology imperative that drives us to propose a climate policy in which research and development are front and center, at least in the initial stages. Given the lags in capturing the total productivity increase of new technologies (diffusion and learning new techniques), it becomes all the more important to act quickly in developing them. But lest there be any misunderstanding, this paper is about mitigation, but mitigation in which technology development policies that make deep emission reductions possible are front and center

Mark Diesendorf, in his book *Climate Action*, published by UNSW Press, 2009, indicates that research and innovation needs to be a key government policy in greenhouse gas mitigation and identifies energy efficiency, biosequestration of CO₂, cleaner industrial processes, new transport technologies and smart electricity grids as high priorities areas.

Garnaut and Shergold in their reports to the Commonwealth Government on emissions trading and climate change recommend government support research and development in energy efficiency and renewable energy.

Garnaut recommends support at the "D" end and observes that the technical risk at the "D" end is frequently high. Shergold reports on an ABARE study that found that accelerating the development of energy efficiency technologies will reduce the economic cost of emission abatement by one third. These reports are covered in more detail in the next section.

The combination of the proposed R&D Tax Credit Scheme reducing government support by about 80% compared to the existing R&D Tax Concession Scheme and focussing on the "R" end will decelerate, not accelerate, the development and implementation of technologies needed to address global warming. Due to the scale of the problem of global warming, the impact on the economy of an ETS, the economic cost may be about the same order as any revenue savings. The rationale for this claim is in the next session

10.1 The Garnuat & Shergold Reports

The Garnaut Report Climate Change Report, 2008 stresses the benefits of R&D in respect to reducing greenhouse gas emissions:

"Basic research and development of low-emissions technologies is an international public good, requiring high levels of expenditure by developed countries".

The Garnaut Report recommends that 20% of the revenue raised from an ETS be used "to support for research, development and commercialisation of new technologies" and subsequently indicates that R&D tax concessions are means for supporting these types of activities.

Thus, if the Commonwealth is concerned about the cost to revenue of the new scheme, then a small amount of revenue from an ETS could be allocated to the new scheme. For example, if the cost to revenue of the new scheme is \$1.3B and 20% of this is for low emission projects, then \$260M of revenue from the sale of ETS permits could be allocated to partly financing the new scheme.

The Garnaut Report supports the case that Government should support the “D” end of low emission R&D by recommending that “early movers” should be rewarded:

“The early movers of a new industry are those that undertake the first demonstration and commercialisation projects. The spillovers from these early mover activities mean that in the absence of government intervention, there will be suboptimal levels of private investment in demonstration and commercialisation in most new industries, the early movers bear all the costs of demonstrating and bringing a new technology to market, while later movers share in all the associated benefits that spill over directly from the early movers’ investments. These spillovers can result in a strong disincentive for any firm to be a pioneer and result in an undersupply of demonstration and commercialisation activities. For some new industries, multiple spillovers may result in no activity at all.”

What Garnaut may be construed as stating is that there should be incentives where a prototype or pilot plant, which involves bring a new technology to market, is used for both R&D and production purposes. His reason – the spillovers that may result.

On the other hand, the proposed R&D Tax Credit Scheme will provide minimal support, except and perhaps in the event of technical failure, thus resulting in sub-optimal levels of private investment in demonstration and commercialisation. The slightly earlier draft Garnaut Climate Change Review Report covers this issue from a slightly different perspective:

“Demonstration and commercialisation: The new knowledge generated by early research is applied to the real world through pilot, demonstration and first commercial-scale projects. These activities tend to be capital intensive in nature, requiring research bodies or firms to take on substantial risk since the technology is yet to be proven in the intended operating environment. Because the technology may not yet be cost-competitive (even after factoring the impact of a price on emissions), commercial returns are problematic. Projects must therefore rely on high-risk venture capital funding, government support, niche market support or philanthropic patronage. Some studies have termed this phase ‘the valley of death’, where most technologies fail either technically or financially.”

Based on what is Garnaut is saying, limiting the funding of activities that are carried out in a production environment where risk is high may be a factor that results in both companies and worthwhile projects failing for financial reasons.

Garnaut is also observing that technical risk at the “D” end is frequently high and a cause of failure. I have observed many occurrences where significant, expensive and unforeseen technical problems. The 2007 Shergold Report on the Task Group on Emissions Trading supports similarly supports Garnaut on the importance of R&D in addressing climate change. For example it states:

“The scale of the global abatement task is such that it will require the development and deployment of currently immature and new breakthrough low-emissions technologies for all sectors of the economy. By their very nature, we cannot at this stage know which of these technologies will be

successful. Attempts to ‘pick winners’, or to rule out any particular approaches, carry high risks and add to the cost of achieving the needed abatement.”

This report is warning against picking winners and this implies a role for the new scheme to fund the thousand of market driven projects needed to reduce emissions by nearly 80% per person. My conclusion, from nearly 30 years working on both R&D Tax Concession and grant schemes within government and as a consultant, is that grants are neither efficient nor effective in supporting R&D and its commercialisation. Companies need to expend considerable resources on preparing a grant application, an answer may take up to 6 months, the effort is wasted if the application is declined and the proposed clawback rules will “clawback” most of the grant as is demonstrated at parts 8 and 11 of this submission. In addition, the costs to government in managing a grant scheme are high.

The Shergold report also reports that accelerated development of low emission technologies may have major economic benefit. Shergold commissioned an ABARE study and reports:

“ABARE provided the Task Group with a further global action scenario. Scenario 5 assumes accelerated technology development and uptake but is otherwise directly comparable to Scenario 4. The enhanced technology development and uptake assumed in Scenario 5 reduces the cost to Australia of achieving the target by one-third, from 1.5 per cent to 1 per cent of GDP in 2030 relative to the reference case. This highlights the potential for enhanced technology development and uptake to significantly reduce the costs of emissions abatement.

Key features of Scenario 5 include the accelerated uptake of advanced and hybrid vehicles; higher efficiency in the generation of electricity, cement, aluminium, iron and steel, pulp and paper products; and the accelerated adoption of more efficient technologies in the services sectors. Enhanced development and deployment of more energy-efficient and low-emissions technologies to 2030 is also assumed (in line with assumptions in the Global Technology scenario in Matysek et al. (2006), with modifications to assumptions about energy consumption by the services and chemicals, rubber and plastics industries).

The enhanced technology assumed in Scenario 5 on its own would have reduced global emissions by about 10 per cent relative to the reference case at 2030. This could be viewed as ‘equivalent’ to bringing forward the reference case ‘global’ technology profile by about five to six years”.

The ABARE study reported above estimates a reduction in costs in achieving a mitigation reduction target of 0.5% or about \$5B of GDP by accelerating the development and uptake of energy efficiency technologies. This study provides evidence that the economic cost of achieving mitigation targets is very sensitive to the development and uptake of new energy saving and renewable energy technologies.

Therefore and conversely, replacing the existing scheme with the R&D Tax Credit Scheme will decelerate the development and uptake of energy efficiency technologies. This is likely to increase the cost of achieving a target. If this increased cost is about 0.1% of GDP or \$1B, the economic cost of introducing the R&D Tax Credit Scheme may be the same order as the revenue savings for this one reason.

Based on what I am observing with my client group it is likely that an increasing number of low emission projects will be supported by the new scheme. I am aware of a new, Australian, low emission technology which will have more than 50 applications in transport, mining, agriculture and manufacture. Each application will involve developing an integrated solution specific for that application, provide many low emission, productivity and other benefits and involve R&D. My guesstimate of the proportion of R&D Tax Credit Scheme projects that will involve low emissions as a technical objective within about 5 years:

- 10 to 30% where low emissions is the primary objective
- a further 20 to 50% where low emissions is a secondary objective.

Since the new scheme will be a means for funding low emission and renewable energy projects and ones that address the various impacts of climate change, it is recommended that revenue from ETS permits be used to fund part of the scheme in proportion to the relative value of such projects supported and that eligibility be not tightened.

11 Grant Clawback Example (small company with tax losses)

A start-up company spends \$100,000 on R&D and receives a \$50,000 government grant in respect to this expenditure. The venture is being funded by equity provided by shareholders and the company has tax losses exceeding \$100,000 and no income.

Current R&D Tax Concession

Currently, the company will receive a R&D Tax Offset refund of \$30,000 in respect to the \$100,000 R&D expenditure and therefore the combined total cash flow benefit will be \$80,000. Tax of \$15,000 will be payable on the grant when the company becomes profitable and liable to pay company tax. If no grant was received, then the R&D Tax Offset payment would be \$37,500.

The Proposed R&D Tax Credit Scheme

For 2010/11 and beyond, the refundable tax credit will be \$45,000, but this will need to be reduced to \$10,000 since the after tax grant amount will need to be deducted from the refundable tax credit amount. The combined cash flow benefit will be \$60,000. Tax of \$15,000 will be payable when the company becomes profitable and liable to pay tax.

Table Summarizing Calculations

	Current Scheme	New Scheme
R&D Expenditure	\$100,000	\$100,000
Grant Payment	\$50,000	\$50,000
Offset/Refundable Tax Credit	\$30,000	\$10,000
Cash Flow Benefit	\$80,000	\$60,000
Net Cash Flow Benefit From Grant (Cash flow benefit less offset/refundable credit if no grant received)	\$42,250	\$15,000
After tax benefit of grant	\$27,250	NIL

Note – the new scheme may provide more carry forward tax losses, but if and how much will depend on how this rule is defined.

12 Who Am I?

This submission was prepared by Dr Terry Freund of Blue Sky Advisory Services. I consider that I am well qualified to respond to the Exposure documents for the proposed Research and Development Tax Credit Scheme. My background includes performing various R&D Tax

Concession roles in administration and management while working for AusIndustry in the period 1986 to 2002 and as a consultant providing R&D Tax Concession services since 2002.