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R&D Tax Incentive

Energy and the R&D Tax Incentive

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Contents

How to use this Guide

The R&D Tax Incentive programme provides an incentive for companies performing eligible research and development (R&D). The programme is legislated and the rules appear in the legislation[1].

What does this guide do?

Research and development can be a powerful driver for energy companies and help create new products, processes and services. Energy plays a significant role in all industrial sectors and impacts on every aspect of our lives. Australia's energy sector encompasses a diverse supply chain which includes energy storage and electricity generation and distribution, transport fuels and emerging renewable energy technologies.

This guide helps clarify how to self-assess the eligibility of energy R&D activities.

A series of examples show how to identify what eligible R&D might be and how to register eligible R&D activities.

No single example (or set examples) can represent the multiple combinations of company structures, operations, management, record keeping systems and expenditure. However, the business scenarios chosen attempt to broadly examine some highlighted issues identified as facing the energy industry and at various points in a business R&D cycle. These issues were identified during consultation with business, industry representatives and tax agents.

While they follow the same format, the focus of each example is different. Through this mix, the Department of Industry, Innovation and Science (the department) has aimed to illuminate the range of issues that arose during close consultation with the energy sector.

In addition, the department provides information on the R&D Tax Incentive that highlights issues relevant to the energy sector through business.gov.au and the *R&D Tax Incentive Information eBulletin*. This edition of the guide replaces the [2013] edition.

If your company is spending money to experimentally solve technical problems or experimentally develop new products or services, you may be undertaking some activities that qualify as R&D under the Incentive. The examples in the Guide [2] address key eligibility requirements such as:

- new knowledge,
- experimental process,

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1 See, division 355 of the *Income Tax Assessment Act 1997*. The definitions of eligible R&D activities are contained in sections 355-20, 25 and 30 of that Act.

[2] The examples used in this guidance are fictional examples created to illustrate application of the *R&D Tax Incentive* to hypothetical commercial enterprises. The examples reflect the department's experience with jointly administering the programme with the Australian Taxation Office. No similarity of the examples to existing enterprises or projects is intended.

- core and supporting R&D activities,
- records management and compliance assurance,
- excluded activities, and
- activities likely to be ineligible.[3]

These concepts are incorporated throughout the guide with clear examples to highlight the issues. Commentary is also provided at the end of each example to direct companies to the important linkages to other guidance that has already been published to assist companies to de-risk their participation in the programme and evaluate their own 'compliance readiness'.

This guidance should be used in conjunction with the *R&D Tax Incentive*: *A Guide to Interpretation* which is available on the business.gov.au website.

Why is it important to use this guide?

This guide will assist companies and tax advisors to understand the eligibility requirements that apply to activities that are supported under the R&D Tax Incentive. Following this guide will:

- enable companies to self-assess and register eligible R&D, and
- help companies avoid:
  - compliance reviews, which may involve additional legal fees and tax agent fees, and
  - potential repayment of the tax benefit.

What is eligible R&D?

Eligible R&D is defined in the legislation. Companies self-assess whether their activities are eligible R&D activities before registering under the programme.

R&D Activities

Under the R&D Tax Incentive, R&D activities must either be:

- **Core R&D activities.** These are systematic, hypothesis-driven experimental activities with an unknown outcome and based on the principles of established science, undertaken to generate new knowledge (including new knowledge in the form of new or improved materials, products, devices, processes or services), or
- **Supporting R&D activities.** These are activities that are not part of the experimental activities, but directly support them.

Registration

The programme is accessed by registering self-assessed R&D activities with the department (this must be done within 10 months of the end of the company's income

[3] See page 8 for summaries of the examples that show these concepts.

year) and claiming for eligible expenses relating to the registered activities in the company's tax return.[4]

Companies applying to register for the R&D Tax Incentive must self-assess their activities against the legislated eligibility criteria. When a registration is accepted this does not mean that the registered activities have been determined to be eligible. The department routinely examines registrations in detail for compliance and may contact companies for further information.

The department applies the programme's legislative requirements during its registration and compliance processes and will do so as set out in its guidance. Registering companies must maintain adequate records that can allow self-assessment by substantiating the eligibility of R&D activities. Companies must ensure expenditure claimed for R&D activities is based on genuine financial records, as is the case for any element of their tax return.

Companies may choose to use an R&D tax advisor to help prepare applications and registrations. However, the use of an R&D tax advisor is not a requirement of entry into any departmental programme and using the services of an R&D tax advisor to assist with the preparation of a registration application and offset claim does not guarantee eligibility. Companies wishing to get an assurance whether particular activities they are currently conducting, or are intending to conduct, are eligible R&D activities may apply to the department for an Advance Finding.

Eligibility must be self-assessed for activities, not for whole projects.

Companies and advisors also need to be aware of expenditure that is ineligible under the R&D Tax Incentive. This includes:

- interest expenditure (within the meaning of interest in the withholding tax rules),
- expenditure that is not at risk,
- core technology expenditure, and
- expenditure included in the cost of a depreciating asset (decline in value notional deductions may apply however).

Note: Readers with questions about the eligibility of expenditure items on R&D activities registered under the R&D Tax Incentive should consult the ATO through its website at ato.gov.au/business/research-and-development-tax-incentive/, by phone on 13 28 66 (for businesses) or 13 72 86 (for tax agents).

Other relevant publications

R&D Tax Incentive: A Guide to Interpretation – this document provides companies with the government's interpretation of the legislative requirements of the programme, including a detailed overview of core and supporting R&D activities. In addition, there are checklists and examples of activities unlikely to meet the programme requirements.

[4] Information on the benefits available through the programme and the registration application form are available on business.gov.au.

Compliance Readiness

The department has released guidance to help companies that intend to register for the R&D Tax Incentive to ensure that they are 'compliance ready'[5]. Compliance readiness means having in place the systems and processes to identify, evaluate and record eligible R&D activities and expenditure on those activities. First-time participants in the programme should seek assistance from the department to make sure they understand the programme's requirements.

The following set of principles is suggested to assist companies in developing appropriate systems and processes to document their R&D activities and associated expenditure. It is important to note that the first step to ensuring compliance is reviewing and understanding the R&D Tax Incentive guidelines and requirements.

These principles have been informed by the department's experience in conducting compliance assurance activities. The principles also take into account key Administrative Appeals Tribunal decisions, where failures in a company's or tax agent's assessment of eligible R&D activities resulted in tax claims for R&D being overturned.

Maintaining contemporaneous documentation that demonstrates eligibility under the programme is essential. Companies cannot establish eligibility without maintaining detailed documentation that records the process of each activity as it develops.

Principle 1

Ensure that internal processes and systems allow for documentation of how activities meet eligibility requirements as part of the overall project planning and management process.

Principle 2

Identify and document eligible R&D activities at the time they are conducted – this improves the potential to capture associated costs in real time.

Principle 3

Document methods for identifying eligible R&D activities and recording expenditure associated with eligible activities. This ensures that there is a clear understanding of how information has been derived and enables the process to be repeated in future years.

Principle 4

Forge strong connections between those responsible for preparing and maintaining R&D Tax Incentive records and staff who understand the technical aspects of activities to enable a shared understanding of programme requirements.

Principle 5

Ensure that strong links have been established between activity and expenditure records.

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[5] *Compliance Readiness – Importance of Record Keeping* and *Compliance Readiness – Risk Review and Findings* are available on business.gov.au.

The Examples

Projects to develop new products or services undertaken by companies are generally comprised of activities. Eligibility under the R&D Tax Incentive cannot be self-assessed at the project level. The legislation governing the programme requires eligibility to be assessed at the level of the activities within the project.

The examples in this document illustrate the eligibility requirements of the programme in the context of activities being conducted in hypothetical business scenarios.

Table 1 provides the reader with an idea of the level of detail contained in the examples on particular concepts.

Example 1 - DSC2U (page 10)

Scenario

Development of a nanocomposite dye-sensitised solar cell with increased efficiency over current dye-sensitised solar cells.

R&D Tax Incentive Principles

This example illustrates the separation of **core** and **supporting R&D activities** and explores the **dominant purpose** requirement of supporting R&D activities. It also highlights the importance of **record keeping**.

Example 2 - BatteryLife (page 15)

Scenario

Development of a thin film lithium ion battery for use in powering small commercial products and medical devices.

R&D Tax Incentive Principles

This example explores the key legislative definitions of **core** and **supporting R&D activities** and the **dominant purpose** requirement of supporting R&D activities. In addition the issue of **grouping R&D activities** is discussed.

Example 3 - WindWake (page 21)

Scenario

Development of an improved computer modelling platform for predicting wind farm noise.

R&D Tax Incentive Principles

The example illustrates the self-assessment of **core** and **supporting R&D activities** by a company conducting software development and undertaking field tests. In addition, issues associated with the **grouping of R&D activities** are discussed.

Example 4 - Energee (page 25)

Scenario

Collaboration between a small company and a large power plant to trial new microalgae bioreactors to optimise microalgae growth and reduce plant emissions.

R&D Tax Incentive Principles

This example explores how companies register activities that need to be **conducted overseas** and provides a brief exploration of the considerations where a government **grant** supports an aspect of the R&D project.

Example 5 - Supplygrid (page 31)

Scenario

Development of a real time smart meter analytics mobile phone app.

R&D Tax Incentive Principles

This example explores how a company can use an **advance finding** to de-risk activities registered under the R&D Tax Incentive. In addition, **records management** and commentary looking at **dominant purpose** in **market research** are included.

TABLE 1 · This table demonstrates a range of relevant issues for companies and their treatment in each of the examples

KEY CONCEPT	EXAMPLE 1 DSC2U	EXAMPLE 2 BatteryLife	EXAMPLE 3 WindWake	EXAMPLE 4 Energee	EXAMPLE 5 Supplygrid
Core R&D activity	■	◆	■	◆	◆
Supporting R&D activity	■	◆		◆	◆
Supporting R&D activity – dominant purpose test	■	■		■	
Detailed exploration of the elements of a core R&D activity		◆			
R&D in field trials	◆		◆		
Grouping R&D activities		■	■		
An example of an activity that is not eligible					◆
Record keeping	◆	◆	◆	◆	■
Overseas finding	■				
Advanced Finding	◆				
Computer modelling			■		
Software			◆		
Feedstock adjustment	●				
Clawback adjustment				■	
Collaboration			◆	◆	

■ Concept explored in the example and an expanded explanation given in the commentary.

◆ Concept explored in the example.

● Concept explored in the commentary section.

Note that the following uses are administered by the ATO:

- Feedstock adjustment
- Clawback adjustment

Example 1: DSC2U

This example explores key definitions of the R&D Tax Incentive in an energy business scenario.

The business scenario and commentary show the application of the key definitions of **core R&D activities**, **supporting R&D activities**, **dominant purpose**, and also demonstrates the importance of **records management** to substantiate claims.

The example also shows how the company self-assessed the eligibility of its activities and was able to successfully apply for the R&D Tax Incentive and receive a tax offset that will help the company develop more innovative energy products.

Business Scenario

DSC2U is a medium-sized Australian company that designs and produces dye-sensitised solar cells (DSCs). The company is focused on continually improving the efficiency of its DSCs and has regularly undertaken activities to improve the performance of its products.

The DSC2U R&D team identified an avenue of research to develop more efficient DSCs through extending the light harvesting region into the near infrared spectrum. The team pitched their proposal to the DSC2U's CEO and received approval to conduct some initial research to investigate the new idea.

The company conducted literature reviews and consulted industry experts to identify if there were any existing methods to extend its DSCs into the near infrared region. This research concluded that there were no known methods to extend the light-harvesting region into the near infrared.

The R&D team submitted a business plan that included a plan to register for the R&D Tax Incentive, outlining the proposed R&D activities required to further develop the DSC which was subsequently approved by DSC2U's CEO.

The CEO had seen information from other companies benefiting from the R&D Tax Incentive and instructed staff to review the various factsheets on the business.gov.au website and familiarise themselves with the legislative requirements. With further guidance from the department's Contact Centre[6], DSC2U felt comfortable enough with the definitions to self-assess its R&D activities as being eligible for the R&D Tax Incentive.

Core R&D Activity 1:

Evaluation of a new nanocomposite material prototype DSC

DSC2U set out to achieve a 4 per cent increase in the efficiency of its DSC by developing a new nanocomposite material that could increase light-harvesting in the near infrared regions.

[6] The department's Contact Centre can provide general information on the eligibility and compliance requirements under the programme. The Contact Centre number is 13 28 46.

DSC2U considered the department's guidance material on eligible R&D activities and self-assessed that testing the nanocomposite material in a solar cell could be registered as an eligible core R&D activity.

The company concluded that it could not be known or determined in advance whether the use of the nanocomposites in the cell would improve the efficiency of the cell as compared to an unmodified DSC. This conclusion was based on the knowledge that no one had used the nanocomposites in DSCs before and that neither DSC2U's expert staff nor the industry experts consulted by the company could determine in advance whether the nanocomposite would increase the efficiency of the cell. To generate the required new knowledge the company needed to conduct experimental activities, whose outcomes could not be known or determined in advance, that were based on established science and proceeded from hypothesis to experiment, observation and evaluation and led to logical conclusions. The company developed a series of DSCs incorporating variations of the nanocomposite material and experimentally tested them against the performance of the unmodified DSC. Each of these experiments had documented hypotheses. Evaluation of the test data enabled DSC2U to identify the nanocomposite that generated the most energy from the conversion of near infrared energy. From this information DSC2U was able to confirm that the incorporation of the new nanocomposite material increased light-harvesting in the near infrared regions and led to an overall 3.8 per cent increase in the efficiency of the DSC.

Supporting R&D Activity 1: *Manufacturing of the DSCs incorporating the optimal nanocomposite material for field trials*

For DSC2U to successfully field trial the nanocomposite modified DSC, it needed to use its assembly line to manufacture a batch of 50 DSCs with the optimal nanocomposite formulation. The company self-assessed that because the activity would not require any experimentation it would not be eligible as a core R&D activity but could be considered for eligibility as a supporting R&D activity. The activity was also self-assessed to be directly related to Core R&D Activity 2, as it provided the prototypes that would be tested in that core R&D activity.

Because the supporting R&D activity produced goods, the company needed to apply the dominant purpose test. The dominant purpose test required DSC2U to consider all of the reasons it had for producing the prototypes and determine which of these reasons was the dominant (i.e. the ruling, prevailing or most influential) purpose. As the prototypes were produced to be tested in Core R&D Activity 2 and were not intended to be sold after use in the experiments, there was no other reason for their production. DSC2U noted in its dominant purpose assessment that the prototype DSCs had not been proven to work outside of laboratory conditions and therefore did not have a direct commercial purpose for their construction.

If DSC2U were to sell the DSCs it produced for experimentation after the trials were completed it would have to consider whether the dominant purpose of the activity was to ultimately sell the goods.

Core R&D Activity 2: *Field trialling the prototype DSC with the optimal nanocomposite material*

The company wanted to determine the efficiency of the new DSC in a variety of environmental conditions. These results would be compared to the base model DSC tested under the same conditions.

The experimental activities consisted of trialling the 50 nanocomposite DSC prototypes against the base DSC under a broad range of temperatures, weather conditions and variations in daylight hours. To ensure the reliability of results, the experiments consisted of trials with a number of nanocomposite and base DSCs.

The results were collected and evaluated by DSC2U and it was found that the efficiency of the nanocomposite DSC slowly decreased in climates with a consistent temperature above 30 degrees Celsius. In addition, the trials found that environments that contained higher levels of airborne dust particles reduced the efficiency of both prototype and base DSCs. However, results indicated that the nanocomposite enhanced DSC was still more efficient than the base DSC over the testing period. DSC2U self-assessed that this activity could be registered as an eligible core R&D activity on the basis that:

- the outcome of the experimental activity to test the performance of the DSC in variable temperatures, weather conditions and hours of daylight could not be known or determined in advance on the basis of current knowledge, information or experience,
- a systematic progression of work based on principles of established science proceeding from hypothesis to experiment, observation and evaluation, and leading to logical conclusions was needed to determine the outcome of the experiment, and
- the experimental activity was conducted to generate new knowledge.

What documentation did DSC2U keep?

As a new applicant DSC2U was initially concerned about the type and quantity of records it needed to substantiate its claim and the added burden it would cause when conducting the R&D activities.

The company contacted the department's Contact Centre and reviewed the *Record Keeping and R&D Planning* Information Sheet[7]. From this information DSC2U determined that the majority of the records it needed were produced and kept as part of DSC2U's routine day to day business management and experiment record keeping activities.

However, some effort was needed to improve the collection and storage of the records so that, if required, it would be a simple matter to substantiate the activities that were conducted, their related expenditures and the reasons why the activities were considered eligible. DSC2U recognised that good records management relied on recording activities and expenditure at the time they were conducted.

Without records that substantiated how its activities met the eligibility requirements, DSC2U could not be able to self-assess that the activities were eligible

[7] The *R&D Tax Incentive Record Keeping and Compliance Readiness: The importance of record Keeping* Guide may be found on the business.gov.au website.

The records that DSC2U maintained included:

- the internal business case and its approval by management,
- data and research from the literature searches that the company conducted,
- correspondence with industry experts about the technology,
- documentation that detailed the prototype designs,
- the hypothesis, the procedure followed and results obtained in all experiments,
- manufacturing records including serial numbers of the produced DSCs, the number of DSCs produced and the time when each DSC was produced,
- records of the manufactured DSCs being used in the experiment, and
- the hypothesis, the procedure followed and the results from the field experiments.

Maintaining these records ensured that the company was 'compliance ready'. The records provided evidence for the company to demonstrate it had met the legislative requirements of the R&D Tax Incentive if it were selected by the department for a compliance assurance review.

Commentary

Core R&D activities and supporting R&D activities are defined separately under the R&D Tax Incentive and companies need to consider the eligibility of their activities with these definitions in mind. It is important to appreciate that the percentage of tax offset that a company is eligible to receive is determined by the annual aggregated turnover of the company and entities connected to or affiliated with the company and not by the breakdown of its activities into either core or supporting R&D activities. The percentage of benefit a company is eligible to receive will be the same for its core R&D activities as for its supporting R&D activities.

Identifying Core R&D Activities

The R&D Tax Incentive rules define core R&D activities as experimental activities whose outcomes cannot be known or determined in advance on the basis of current knowledge, information or experience. They must follow a systematic progression of work that is based on the principles of established science, and proceed from hypothesis through to experiment, observation and evaluation leading to logical conclusions, and be conducted for a significant purpose of generating new knowledge.

Identifying Supporting R&D Activities

Activities that do not form part of the experimental activities may be eligible as supporting R&D activities. This means that, as in the DSC2U example, companies may claim expenditure on activities not undertaken for the purpose of generating new knowledge but that are directly related to one or more core R&D activities. To be directly related a supporting R&D activity requires a direct or immediate facilitating or enabling link to the experiment/s in one or more core R&D activities.

Dominant Purpose

There is however, an additional consideration where the activities:

- produce goods or services
- are directly related to producing goods or services, or
- are referred to in the core R&D activities exclusion list[8].

In all these situations, the activities must also be undertaken for the dominant purpose of supporting one or more core R&D activities to be eligible. Companies should weigh up the various purposes for conducting the activity and then determine the dominant purpose (i.e. the ruling, prevailing or most influential purpose) for undertaking that particular activity.

When undertaking supporting R&D activities which may be viewed as production in nature it is important to demonstrate that the overarching 'dominant purpose' is to support the core R&D activity. In determining the dominant purpose of an activity, consideration is given to the overall circumstances within which the activities are conducted. It is possible that similar activities may be eligible in one context, but not in another.

At times, companies may use their own production line to produce the supporting materials for a core R&D activity (such as prototypes or material samples to be tested). It is important to maintain records of this production in order to be 'compliance ready'.

In producing the nanocomposite enhanced DSC, DSC2U needed to demonstrate that the activity was conducted for the dominant purpose of supporting the core R&D activity. The company did this by maintaining records of production line runs, quality assurance documentation and serial numbers of individual nanocomposite sheets developed, and noted how they correlated with the records of the experimental activities undertaken using these sheets.

Feedstock

Companies may make the business decision to sell or use the immediate product of their eligible R&D activities (DSC2U may have elected to do this with the DSCs that it produced for the experimental trials after the trials were complete). Companies that do this need to examine the feedstock rules, (which are available on the ATO website[9]) and include the necessary feedstock adjustment amount in their income tax return.

[8] The list of excluded core R&D activities and commentary on their meaning may be found on page 25 – 40 of the *R&D Tax Incentive: A Guide to Interpretation* which is available on the business.gov.au website.

[9] Information on Feedstock Rules is available on the ATO website at https://www.ato.gov.au/

Example 2: BatteryLife

In this example a company working in the proof of concept space developed new technology for thin film lithium ion batteries that can be used for powering small commercial products and medical devices.

The example illustrates how the company effectively **self-assessed** the eligibility of its core and supporting R&D Activities and provides commentary and insight on:

- **Core R&D Activities,**
- Not knowable or determinable in advance,
- Purpose of generating new knowledge,
- Hypothesis and experiment,
- Observation and evaluation,
- **Supporting R&D Activities**, and
- Dominant purpose test.

Business Scenario

BatteryLife is a small start-up R&D company established by a group of entrepreneurs who met as chemistry students during their university Honours year. The company's business model is focused on the development of novel energy storage ideas through to the proof of concept stage.

Once proof of concept has been established, the intellectual property (IP) is marketed to larger companies to develop and commercialise. BatteryLife has recently begun to focus on innovations relating to powering small devices.

Having observed the miniaturisation of small device batteries for a number of years, BatteryLife was interested in the next generation of energy storage. The company identified a possible innovation in the construction of thin film lithium ion batteries but was not sure if the idea would provide an appreciable improvement to the energy density over currently available battery technology.

For this project the company focused on experimentally determining and evaluating the electrical, physical flexibility and durability properties of:

- the solid state electrolyte (electro-conductive Polymer Y) - Core R&D Activity 1,
- the separator (non-conductive Polymer X) - Core R&D Activity 2, and
- both Polymers (X and Y) in a cell - Core R&D Activity 3.

The company believed that these activities could lead to improvements to batteries, including:

- more cells to be stacked in a given space thereby providing a higher energy density,
- producing smaller batteries while still carrying the same energy density,
- physically flexible batteries for novel applications, and
- greater durability rapid recharge.

Core R&D Activities

BatteryLife considered the department's guidance material on eligible R&D activities and self-assessed that their experiments could be registered as core R&D activities[10]. In making this determination, the company examined a number of variables including the required thickness of the polymer electrolyte and the non-conductive polymer/graphene substrate, the energy storage properties of the new technology and the flexibility of the new technology in cells and in a battery. Specifically the company identified three core R&D activities that tested the electrical, physical flexibility and durability properties of:

1. the solid state electrolyte,
2. the separator, and
3. both polymers in a cell.

Grouping Core R&D Activities

The company decided that it would group its core R&D activities into a single core R&D activity to register with the department. Although this is not a requirement, the company made the decision on the basis that it was easier not to split expenditure on common cost items. Companies may identify other reasons as to why they wish to group activities, however the essential requirement to fully explain what has been done in the activity is the same as for non-grouped activities.

When BatteryLife registered its single core R&D activity it was careful to explain the hypotheses, experiments and methodologies with sufficient detail to ensure the department could understand that there were three sets of related experiments in the core R&D activity and what had been done in each of the experiments.

Not knowable or determinable in advance

Before spending money on R&D activities, the company needed to be sure the outcome of the activities could not be known or determined using existing knowledge. BatteryLife needed to make sure it documented how it knew the outcome of the experimental activities could not be determined before it created and tested the technology.

BatteryLife undertook a global literature review of battery technologies and documented the outcomes. This was part of normal business processes as the company regularly undertook these types of searches to maintain its knowledge of new developments and to plan its R&D.

BatteryLife documented the current state of knowledge of graphene and electro-conductive polymer technology which showed that there was no reasonably available information anywhere in the world that the two technologies had been tried together to form part of a battery component. The founders added their own notes to the documented searches that stated on the basis of their knowledge the energy density, retention and flow of the ultra-thin electro-conductive polymers could not be deduced on chemical principles alone.

[10] More detail on these experiments can be found under the *Hypotheses and experiments* sub-heading on the following page.

Hypotheses and experiments

Prior to assessing the eligibility of its R&D activities, BatteryLife had scoped the activities from the development of its initial hypotheses through to the design of the experiments that would test the hypotheses and the manner in which it would evaluate the results of the experiments.

BatteryLife's initial hypothesis was:

> a ten molecule thick layer of Polymer X deposited on each side of a five molecule thick graphene scaffolding will produce an electrolyte layer that will exceed an energy density of 1200 watt hours per kilogram.

BatteryLife developed this hypothesis further and undertook additional experiments that varied the thickness of the electrolyte layers and the graphene scaffolding. In the experiments, the various thicknesses of the electrolyte layer were installed with market standard anodes and cathodes and an electrical charge was applied to build up the charge in the system. The charged system was then tested by examining the discharge rate of the cell until fully discharged.

In addition to these experiments, BatteryLife designed a series of experiments to test the recharge rate of various thicknesses of the electrolyte layer.

BatteryLife also prepared hypotheses and designed experiments to test an ultra-thin substrate of graphene coated with Polymer X. Polymer X is a non-conductive compound and the experiments needed to test the structure's insulation properties at various thicknesses in addition to its strength and physical flexibility. The strength and physical flexibility was examined through a mechanical regime of impacts, pressures and flexions on the graphene/Polymer X composite samples. The samples were periodically tested throughout to assess the impact of these tests on the samples' electrical properties.

Finally, BatteryLife prepared hypotheses and experiments to test the electrical, physical and durability properties of the electrolyte and separator when combined together in a cell.

Each of BatteryLife's experiments was designed to test specific hypotheses that the company developed and recorded. On occasions, the outcome of the experiments were not as the company had anticipated and these results raised additional questions that led to the hypotheses being modified and additional experiments being conducted.

Observation and evaluation

As the experiments were being designed, BatteryLife was careful to plan and document the method of experimentation used and the type of data that the experiments would generate to enable it to understand how to evaluate the experiments against the corresponding hypotheses.

The company tested the electrical density by charging the prototype cell and measuring the rate of its electrical discharge against different components until the cell was fully discharged. Once the data was collected, the company examined the performance of the cell in its different configurations and assessed the performance against BatteryLife's previous research on existing technology. These evaluations allowed the company to see how its prototype technology rated and whether the project was worth pursuing further. The evaluation also showed the company what

the optimum thickness of the solid state electrolyte/separator was. The evaluations further determined the minimum thickness needed for the best functioning of the substrate.

Supporting R&D Activities

BatteryLife had undertaken significant preparatory work prior to completion of the experimental design and the running of the experiments. This preparation included the research and consultations it conducted to narrow the scope of its experiments. As a small start-up company, BatteryLife also needed to conduct negotiations for the use of some lab time to run the high cost equipment it required to build its prototypes for the later experiments.

The company self-assessed these activities as a supporting R&D activity on the basis that none of the activities in themselves required experimental activities to be conducted, but each of the activities directly supported core R&D activities.

What documentation did BatteryLife keep?

As part of its standard business practices, BatteryLife was meticulous in the planning of its R&D project, which provided the company with many of the documents it needed to fulfil its record keeping requirements under the R&D Tax Incentive. BatteryLife's record keeping strategy was to ensure that documents were kept which demonstrated each aspect of the eligibility requirements.

The company kept documents that detailed the hypotheses, the experiments, the results of the experiments and the evaluation of those results. This demonstrated the company's compliance with the eligibility requirement that core activities are experimental activities that proceed from hypothesis to experiment, observation and evaluation and lead to logical conclusions.

The company documented its technical research that showed that the new technology had never been tested and its notes that demonstrated why the technical research staff, as experts in the energy storage field, could not work out whether the technology would work without experimentally testing it. These documents provided evidence that the activities complied with the core R&D activity requirement that the outcome of the experiments could not be knowable or determinable in advance of the experiment.

Together, these two document sets provided good evidence that the company's activities complied with the requirement that core R&D activities are conducted for a significant purpose of generating new knowledge.

The company also kept all of its expense receipts and time logs for its own paid hours and also those of its contract workers. The time logs recorded the time involved in undertaking literature research that directly impacted on the design of the experiments, the construction of the prototypes and in conducting experimental activities. These were in addition to the written agreement with the lab for the use of the equipment.

Commentary

Grouping of Core R&D Activities

Companies may decide to group a number of core R&D activities into a lesser number of core R&D activities. For example a company may initially self-assess that it has three core R&D activities and later decide to group the activities into a single core R&D activity for the purposes of registering its activities. This is most feasible when the experiments are closely related.

When grouping core R&D activities into a single core R&D activity for registration it is important for companies to provide detailed explanations of the experiments in their registration to ensure that department understands what has been done. The department undertakes registration compliance checks and may need to contact companies for further information if the details in the registration are insufficient.

Including explanations during the registration process will save companies time and reduce the likelihood of further compliance activities.

The eligibility of each activity must be able to be self-assessed and substantiated, whether grouped together or not (cf *Mt Owen*[11]). It should also be noted that:

An applicant cannot succeed in establishing those requirements [the elements for a core R&D activity] *in the absence of detailed documentation recording the process of each activity as it develops*[12]*.*

Accordingly, the company understood that grouping activities did not avoid the need to identify the specific experimental activities. It knew that it would not be compliant with its legislated obligations if it were to rely on an 'overarching' hypothesis' for the whole activity.

Grouping of Supporting R&D Activities

BatteryLife could have self-assessed the activities that support its core R&D activities such as the initial research, idea formulation, hypothesis development and construction of prototypes were individual supporting R&D activities. However, the company decided that it would group these activities under a single supporting R&D activity in its registration.

The company chose to group the activities as it made its registration process with the department faster and easier to manage. In doing this, the company made a conscious decision to ensure its details in their registration were clear so that the department would be able to understand what work was undertaken.

More information on this topic may be found in How Should Companies Group R&D Activities? on business.gov.au.

Dominant Purpose

BatteryLife understood that a dominant purpose test applied to activities that produced goods or services. The dominant purpose test requires any activity that produces goods or services to be conducted for the dominant purpose (i.e. the

[11] For a summary of the key points of this case, see https://www.business.gov.au/Assistance/Research-and-Development-Tax-Incentive/Administrative-Appeals-Tribunal-AAT-decisions/Mt-Owen-2013

[12] Docklands Science Park Pty Ltd v Innovation Australia [2015] AATA 973 at 63

ruling, prevailing or most influential purpose) of supporting an eligible core R&D activity.

The company self-assessed that the only part of the supporting R&D activity that might be considered to produce goods or services was the activity to construct the prototype cells. The company constructed sufficient cells for it to conduct the experiments and was careful to document this use. The company's documentation also noted that the prototypes were not commercially useful to a consumer and the acquisition of these prototypes by a competitor would greatly devalue the eventual sale of their proof of concept. These documents supported BatteryLife's claim that the activity to build the prototypes was for the dominant purpose of supporting its experimental activities. The company's retention of this documentation was considered a vital ingredient to establishing the basis of its claims should the company be selected for a compliance review.

Example 3: WindWake

This example illustrates a company undertaking its self-assessment of activities conducted in an R&D project involving field testing.

The self-assessment of **core** and **supporting R&D activities** are explored in this example which includes **computer modelling** activities, new **software development** and **field testing** at wind farms. The example discusses issues associated with the **grouping of R&D activities** and implementing **new and established technologies and products**.

Business Scenario

WindWake is an Australian company with research strengths and established know-how in wind data analysis and wind flow modelling technologies.

The company operates globally in the development of high resolution wind maps, wind farm site prospecting and wind farm design. Emerging initially as a university spin-off company, WindWake acquired foundational software upon which it conducted further development to produce a number of proprietary temporal and spatial wind flow modelling and analysis software products.

As recognised experts in wind modelling science, WindWake provides consultancy services in wind farm prospecting and environmental impact studies. In response to planning authority requirements about the noise impacts of wind farms, the company commenced an R&D project to develop a new software product to model and predict noise from wind farms more effectively. To this end, WindWake registered a number of R&D activities with the department that involved data collection, design of computer modelling, physical model development, new algorithm development and field testing at a limited number of Australian wind farms.

After reading the department's guidance material, WindWake self-assessed its software development project against the programme's eligibility criteria and registered the following activities.

Core R&D Activity 1: *Development of new wind farm noise prediction modelling algorithms for proprietary software*

The advanced prototyping involved the development of new algorithms to drive modelling software to analyse and predict noise generation and reduction scenarios in wind farms.

The project objective was to measure and model new and previously unmeasured noise variables to deliver a 40-70 per cent improvement in the predictive accuracy of its low-frequency aerodynamic noise modelling software compared to existing noise prediction software and methods. The new noise prediction and modelling algorithms required development and testing activities to capture and analyse new combinations of noise impact variables.

To undertake its self-assessment for the programme, WindWake needed to identify which of the activities it conducted in its project were activities that meet the requirements for eligible core or supporting R&D activities. It knew that there would be many activities in the project that were routine software development activities

that were neither core nor supporting R&D activities and were therefore not eligible for to be claimed under the programme.

Hypotheses were developed and corresponding experiments were conducted on the algorithms and new variables to enhance sensitivity modelling of both quantitative and qualitative audible aerodynamic noise development and decay effects.

The hypotheses in this activity tested technical relationships that existing information, knowledge and experience available to relevant professionals in the field could not determine without first conducting an experiment.

Initially, data from supporting R&D activity 1, to tentatively evaluate and shape the early stage progress of its algorithms, was used. Once the algorithms could deliver the required predictive power against the virtual noise maps from supporting R&D activity 1, further experiments and algorithm development were conducted on the basis of feedback from the experimentation against real world noise being conducted in core R&D activity 2.

Experimentation included investigating mathematical relationships in acoustic profiling, dynamic range thresholds and topographic sound pressure impacts. In developing the algorithms the activity needed to consider seasonal weather conditions, substrate hardness, and sound propagation and ground attenuation characteristics, such as sloping topography, foliage growth and other object encounters to detect diffraction and reflection sound paths from sources and variable absorption characteristics.

Core R&D Activity 2: *Field testing and algorithm performance experiments*

This activity was the physical site testing of the new algorithms in the software. The experiments involved the outputs generated from the new algorithms and their predictive reliability against actual wind farms of variable turbine size and number. The feedback from this activity led to further development of the algorithms being developed in core R&D activity 1. This occurred when the performance of the algorithms failed to deliver the required predictive modelling outcomes.

The activity was conducted at real sites of small, medium and large scale wind farm environments across eastern Australian States.

Supporting R&D Activity 1: *Use of existing wind flow modelling software*

This activity involved the use of existing computer wind flow, noise analysis software and seasonal LIDAR mapped landscapes with foliage to produce and map a control set of hypothetical aerodynamic noise data across a range of hypothetical and virtually replicated wind farms.[13] The activity was undertaken to establish a base line from which the performance of the new noise prediction algorithm performance was assessed ahead of the real site testing. This involved the generation of data and replication and verification of existing physical systems using known technology.

[13] The use of existing models to generate outputs may meet the criteria for a supporting R&D activity if it can be shown to be directly related to a Core R&D Activity but is unlikely to meet the requirements to be a Core R&D Activity in itself.

Supporting R&D Activity 2: *Set-up of site testing apparatus and noise capturing equipment*

This activity involved enabling the algorithm testing conducted in core R&D activity 2 and included equipment hire, personnel and administration costs. While essentially logistical in nature, the activity was directly related to testing in core R&D activity 2 (and core R&D activity 1? as it led to reiteration of the algorithms) which could not have proceeded without access to physical site data.

What documentation did WindWake keep?

WindWake kept appropriate documentation to verify eligibility of its activities and substantiate its claim for the R&D Tax Incentive. The company's effective management, good planning and record keeping practices all contributed to its ongoing successful innovation.

In relation to its R&D activities, the company kept a register of all of the relevant technical scoping documents – these could be used to substantiate its claim should it be subject to a compliance review by the department. For example the company maintained the following:

- results of test runs of the algorithm, including 'failed' tests that produced inconsistent or incorrect results, and documented the results of running the prototype with the test/control data,
- an 'experimental log'/issues log with detailed comments on the prototypes indicating development, testing and improvements of the algorithm, indicating for each issue how the problem was identified, who worked on the solution and what solutions were tried,
- an electronic folder/management system for recording all key emails and correspondence relating to proposed R&D including associated software development and code repository/pseudo code tickets, proposed modelling systems and validation testing reports, and
- methodology, results and analysis for the testing undertaken in the field and records of cost estimation for undertaking the R&D activities.

Commentary

WindWake's R&D activity identification and rationale

WindWake outlined in its registration that both its core and supporting R&D activities were conducted in a systematic manner for the purpose of generating new knowledge (i.e. producing improved noise prediction software). In the above self-assessment scenario, WindWake assessed that only core R&D activity 1 and core R&D activity 2 required experimental activities that involved the full spectrum of a hypothesis, experiment, observation, evaluation and led to logical conclusions about unknown outcomes.

Although the primary purpose of supporting R&D activity 1 was to create a rich control/data set to populate and compare against the new noise prediction software itself, these activities were not experimental activities. As a result, WindWake self-assessed and registered these activities as supporting R&D activities. The eligibility of this activity as a supporting R&D activity was substantiated through WindWake's documentation and evidence of the clear and direct relationship to core R&D activity 1.

Grouping of Core or Supporting R&D Activities[14]

In light of the above scenario and activity descriptions, WindWake could have viewed its activity breakdown differently. Depending upon the specific details and the degree of relatedness between the activities it may be reasonable for companies to group activities together in its registrations rather than separating them. In the WindWake example above, it would have been reasonable for the company to have combined core R&D activities 1 and 2 into a single core R&D activity.

This is because WindWake's experimentation in core R&D activity 1, which developed the noise modelling algorithms, and the experimentation in core R&D activity 2, which field tested the noise modelling software, were not only closely related but were interdependent. The field testing of the modelling algorithms was a continuation of their experimental development.

When making a self-assessment on whether to group activities, companies need to consider how close activities are to the experiments, their significance to the experiments and the record keeping requirements that can substantiate the grouping rationale.

Companies should note that the department is required to apply the legislative requirements when it conducts registration checks and compliance reviews. This means that, whilst it takes care not to unnecessarily re-classify activities that have been self-assessed as core R&D activities, it will do so if it is apparent that the registrant has self-assessed an activity as core rather than supporting and that the classification will lead to an incorrect self-assessment of eligible activities.

[14] For more information on grouping R&D activities see the department's guidance publication *How should companies group R&D activities* which is available on business.gov.au.

Example 4: Energee

This example outlines key definitions of the R&D Tax Incentive in a practical energy business scenario.

It explores R&D that cannot be conducted in Australia and examines the requirements for conducting overseas R&D activities when applying for an **overseas finding**. The example also briefly explores some issues around **collaboration** and **clawback rules for grant funding**.

Business Scenario

Energee is a medium-sized Australian company interested in the development of renewable energy technologies that reduce carbon emissions from the use of fossil fuels. In the past, the company had investigated how to improve the use of microalgae to produce an alternative transport fuel.

Energee successfully tested a new design of a closed photobioreactor (PBR) on a small scale. However, the company encountered problems with scaling up the process. The company discovered that when the PBR was scaled up, the amount of high purity industrial grade CO_2 needed to sustain the reactor became a significant consumable cost that impacted the overall production economics for the biofuel.

The company embarked on a project to improve the process of growing microalgae with their PBR on a large scale. The project team brainstormed ideas and solutions that could be implemented to use an existing source of CO_2 and thereby assure the project's green credentials. Through exploring the idea of hybrid technologies, the team considered whether a beneficial cycle could work with microalgae and different power plants (specifically coal fire and natural gas). The team came up with an idea of directing flue gas emissions from a power plant to supply CO_2 to the microalgae in the PBR. Through this integration, Energee could potentially offer a solution in reducing CO_2 emissions, while cultivating microalgae for biofuel production.

To determine the feasibility of its planned project, the company approached a relevant industry CRC to find potential partners and to learn about collaboration avenues. The CRC advised Energee about Kathco, a large energy company that controlled several coal power plants around Australia. Kathco's management board had developed a company objective to reduce emissions through innovation and were already exploring avenues to introduce technologies that would reduce the emissions intensity of its coal energy production.

Energee reached an agreement to use Kathco's power plants for its experimental activities that would examine the impact of using flue gas from power plants as a source of CO_2 on the survival, growth and reproduction of microalgae. In return, Energee agreed to:

- include Kathco in any publicity relating to its project to reduce carbon emissions,
- guide Kathco's early exposure to the new technology, and
- reduce the maintenance and purchase costs for Kathco when the PBR became commercially available.

Energee reviewed the various government incentives supporting the sector. The company applied for a grant that supported companies investing into clean energy alternatives. This allowed the company to receive funds for the early cash intensive stages of the project. In addition, Energee looked at guidance material on the R&D Tax Incentive to investigate whether receiving a grant would affect its eligibility for the R&D Tax Incentive. The company found that although it would be required to calculate a clawback adjustment, the eligibility of its activities for the programme would not be affected. In the course of its self-assessment, the company decided to register one core R&D activity and one supporting R&D activity both of which were conducted in Australia, as well as one overseas supporting R&D activity.

Core R&D Activity 1: *The effect of using power plant flue gas as a source of CO_2 on microalgae biomass*

Energee considered the department's guidance material on eligible R&D activities and self-assessed that the investigation of the effect of flue gas composition on microalgae growth could be registered as an eligible core R&D activity. The company's rationale for this decision was that:

- the effects of flue gases on the growth of Energee's modified microalgae strain were unknown and could not be determined in advance,
- a systematic progression of work based on principles of established science, and proceeding from hypothesis to experiment, observation and evaluation, leading to logical conclusions would be needed to generate this new knowledge, and
- it was undertaking the activity for the purpose of generating new knowledge.

The project team developed a set of hypotheses and designed experiments to test the hypotheses.

The initial hypothesis was that the power plant flue gases (which contain a mix of gasses and particulates that can include CO_2, soot, carbon monoxide, sulphur oxides etc) would not have an adverse impact on the survival, growth and reproduction of the microalgae. The company would evaluate the experiment by monitoring the effects of flue gases from different types of power plants on the propagation of microalgae. As the microalgae was a genetically modified strain, specifically developed by Energee for the optimal generation of biofuel using pure CO_2, the impact of impure sources of CO_2 on the propagation of the microalgae was unknown.

Energee used a number of different types of Kathco's power plants (brown and black coal fired plants and natural gas fired plants) that fed flue gas into the installed PBRs. These PBRs were monitored over the period of a month and microalgae biomass was recorded daily. The results were compared against a control PBR that was fed only concentrated CO_2. The project team recorded the compounds present in each PBR and the volume of flue gas emissions piped through the PBRs during the course of the experiments.

On the completion of the experiments, the project team analysed the results and grouped the plants as A, B and C based on the type of power plant. From the results it was determined that PBRs supplied with flue gases from power plants in the C group (power plants that used natural gases to generate electricity) produced a greater yield of microalgae biomass. When compared to the control group that was

supplied with pure CO_2, the group C power plants showed comparable biomass production whereas the power plants from group A and B produced significantly less.

The experimental design ensured the experiments would deliver outcomes that were comparable with each other by ensuring the flow rate of gasses from the different types of power plant were the same. To evaluate the hypotheses fully and to ensure the flow rates themselves were not confounding the results, the experiments also examined low, medium and high flow rates that were standardised for each power plant type.

Supporting R&D Activity 1: *Literature review and industry expert consultation*

Energee undertook literature reviews and consulted with industry experts about whether the CO_2 emissions from power station flue gas would support microalgae growth. Through these activities, the company learnt that flue gases could contain complex mixtures of compounds and gases including sulphur and heavy metals, which might affect microalgae growth. In addition to the different compounds, the effect of the emissions flow rate and the location of the PBR at the plant were also important considerations for the cultivation of the microalgae.

Using the department's guidance material, Energee self-assessed that activity as an eligible supporting R&D activity. This was based on the rationale that the literature reviews were directly related to the planned core R&D activity and did not satisfy the definition of a core R&D activity. That is, the work did not itself involve an experiment.

Stage 2: *Overseas manufacture of prototype pipes and PBR*

Supporting R&D Activities

In the previous financial year, Energee undertook R&D to develop and test its PBR and claimed the related expenditure under the R&D Tax Incentive. It was discovered at the time that the necessary facilities to manufacture the PBRs were not available in Australia, resulting in Energee contracting an overseas company to manufacture the test PBRs which were then transported and tested in Australia by the company.

Energee decided to contract the same overseas company to undertake the manufacture of the large PBRs and connecting pipes that could withstand the corrosive nature of the flue gases required for the experiment. This was registered as an overseas supporting R&D activity on the basis that:

- the manufacture of the PBR did not require experimentation,
- without the manufacture of the pipes and PBR, the core R&D activity of investigating the influence of flue gases on microalgae growth could not be conducted,
- the manufacture of the pipes and PBR was undertaken for the dominant purpose of supporting the core R&D activity,
- the facility to manufacture the PBR was not available in Australia,
- there was a significant scientific link to the Australian core R&D activity of investigating the influence of flue gases on microalgae growth, and
- the expenditure on the activity to be conducted overseas was less than that incurred on the related R&D activities conducted in Australia.

In order for Energee to register its overseas activities it needed to obtain an Overseas Finding from Innovation and Science Australia. The company completed a *R&D Tax Incentive Application: Advance/Overseas Finding*[15] application and submitted it to the department. The overseas activity was found to be eligible by Innovation and Science Australia, and Energee was issued with an Overseas Finding Certificate.

What documentation did Energee keep?

As Energee had previously applied for the R&D Tax Incentive, it was familiar with the documentation required to support its R&D claim. It maintained a detailed project plan that included the project objectives, research hypotheses, experimental methodology and milestones. The company ensured that the literature searches and industry consultation conducted were documented.

While conducting the R&D activities the company ensured it kept careful records documenting its results, analysis and conclusions of the experiments.

Where the R&D activity was undertaken by a contractor, documents relating to the contract, the R&D activities, the project report and invoices all contained:

- the date the R&D activities were undertaken,
- correspondence with Kathco that described the nature of the collaboration and the design of the experiments, including emails from the plant's operational staff suggesting ways to install the pipes in the plant's infrastructure,
- correspondence with the contractor finalising the design of the PBR and the choice of materials best suited to exposure to flue gases,
- sufficient detail to determine the amount of expenditure on the R&D activities, and
- a description of the activities performed by the contractor to link the costs with a particular R&D activity.

Energee's record management system has proven to be of great benefit to the company by:

- enabling the company to quickly review its prior learning and corporate knowledge,
- providing the documents to secure new intellectual property, and
- enabling the company to be 'compliance ready' – ready to substantiate its claim if it were to be selected by the department or the Australian Tax Office for a compliance assurance review or audit.

Commentary

Dominant Purpose

When conducting supporting R&D activities that may have a commercial nature, it is important that companies evaluate the extent of the commercial activity and determine whether the dominant purpose is to support the core R&D activity.

In this example, Energee's application of the dominant purpose test to the manufacturing activity resulted in the company's self-assessment that it

[15] The Advance/Overseas Finding application is available on the business.gov.au website.

manufactured the PBRs for the dominant purpose of supporting core R&D activity 1. Key reasons for this assessment included the facts that Energee only manufactured enough large reactors for the R&D experiments and the company only used the equipment for experimental purposes. Energee also ensured that the manufacturer maintained daily records of production line runs, quality assurance documentation and batch numbers of produced goods to help substantiate Energee's overseas activity.

Advance/Overseas Finding

The advance and overseas finding process is designed to provide certainty to companies about entitlement to benefits under the R&D Tax Incentive. It provides a binding determination issued by Innovation and Science Australia as to whether certain activities are eligible to be claimed under the programme.

Overseas work must satisfy four requirements in order to be eligible as an overseas activity:

1. the overseas activity must be an eligible R&D activity,
2. the overseas activity must have a significant scientific link to an Australian core R&D activity,
3. the overseas activity must be unable to be solely conducted in Australia or its external Territories[16], and
4. the project's expenditure on the overseas component cannot exceed the expenditure on the related Australian components.

The overseas activity must be an eligible R&D activity

If a company seeks an Overseas Finding on either a core or a supporting R&D activity, it is required to demonstrate that the activity satisfies the definition of either a core or a supporting R&D activity (i.e. subject to all the relevant eligibility criteria of either a core or a supporting R&D activity).

The overseas activity has a significant scientific link to an Australian core activity

Energee provided documentation in its overseas finding application that explained how the overseas manufacture of the PBR was directly related to, and had a significant scientific link to, the core R&D activities conducted in Australia, the 'Australian core activities'. *An activity has a significant scientific link to Australian core activities if those core activities cannot be completed without the overseas activity being conducted*. In its Advance/Overseas Finding application, Energee clearly showed the link between the planned overseas activity and the Australian core activity. The company explained that without the manufacture of the PBR, the experimentation on the influence of flue gases on microalgae growth could not be undertaken.

[16] See the Specific Issue Guidance *Overseas Findings: What does 'not available in Australia' mean?* which is available on the business.gov.au website for more information.

The overseas activity must be unable to be conducted in Australia

As part of the overseas finding application process Energee also provided documents that substantiated its claim that the activities could not be conducted in Australia. To be eligible for the R&D Tax Incentive, the R&D activities proposed to be conducted overseas must not be able to be conducted solely in Australia (or its external territories) for one of four reasons:

1. conducting the R&D activities requires access to a facility, expertise or equipment not available in Australia or its external territories,
2. conducting the R&D activities in Australia or its external territories would contravene a law relating to quarantine,
3. conducting the R&D activities requires access to a population (of living things) not available in Australia or its external territories, or
4. conducting the R&D activities requires access to a geographical or geological feature not available in Australia or its external territories.

Before applying for an overseas finding in the current financial year Energee conducted a literature search and consulted an engineering expert who knew the Australian industry. Energee confirmed that the expertise and facilities were not present in Australia. The company demonstrated this by providing literature references and meeting minutes with the expert.

Total expenditure on eligible overseas activities of the project must be less than the expenditure on the eligible Australian R&D activities

An important consideration for companies is whether the total overseas expenditure is less than the total expenditure on the related Australian core and supporting R&D activities. This includes past expenditure and expenditure reasonably anticipated to occur in the future by all entities. If the expenditure on overseas activities (both actual and reasonably anticipated in all income years by all entities) is greater than the expenditure on activities conducted in Australia, a company will not be eligible for a positive overseas finding for the overseas activities. However, the R&D activities conducted in Australia could still be eligible for the R&D Tax Incentive.

In this example, Energee included the actual and reasonably anticipated expenditure that would be incurred for its overseas activities. In the calculation Energee included its overseas expenditure from the previous year. Given that all prototype design, development and subsequent testing of the manufacturing units were conducted in Australia, the total Australian expenditure was still greater than the overseas expenditure.

When does clawback apply?

A clawback adjustment[17] may apply where a R&D entity receives, or becomes entitled to receive, a recoupment (including a grant) from an Australian government agency or State/Territory body that relates to R&D activities, unless the recoupment is received or receivable under the Cooperative Research Centres (CRC) programme.

[17] Information on Clawback Adjustment is available on the ATO website at: www.ato.gov.au

Example 5: Supplygrid

This example shows a company applying for the R&D Tax Incentive for the first time. The company used the guidance developed by the department to register its activities for the R&D Tax Incentive.

The example explores how **advance findings** can be used to mitigate risk, as well as provide certainty to companies who are unsure of the eligibility of activities under the R&D Tax Incentive.

The example also examines **records management** and provides commentary on the application of the **dominant purpose** test in the context of market research activities.

Business Scenario

Supplygrid is a large Australian energy distributor that has supplied natural gas and electricity for 20 years.

In recent years, Supplygrid has been working on new technologies to improve interaction and relationships with customers. While watching the growth of smart meters being installed in households, Supplygrid identified an opportunity to develop a new service offering for customers.

The company planned to create a software system that could collect and analyse large data sets from household smart meters in real time. The company's proposal aimed to provide real time visualisation of consumption levels and estimated billing forecasts for customers through a mobile app. The company believed the app could provide customers with flexible pricing opportunities and give it the capability to use the data to quickly identify any electrical faults that occur in the lines that supplied the data.

The company engaged industry experts in data analytics and conducted literature reviews to determine if it could buy an off-the-shelf technology or find the knowledge to produce a technology that would allow it to implement the service. However, the company determined that the infrastructure and software needed to manage and analyse the required level of data was not currently available. Additionally, the company discovered that the knowledge of how to overcome specific technical challenges and to develop the algorithms to drive the software, was not available or able to be known without experimentation. Supplygrid decided to conduct an R&D project to develop the specialty algorithms to store and search the large datasets and that would drive the software system needed to implement the service.

The R&D team received the approval of Supplygrid's management board to develop a prototype software system for evaluation. Initially, the company was unsure about the eligibility of its planned R&D activities. In particular, the company wanted assurance that the records of the activities it had undertaken in its attempts to identify either a pre-existing solution or whether a solution could be determined without an experiment, was sufficient evidence. Additionally, the company also wanted confirmation that the department would agree with its dominant purpose assessment of its planned collection of customer usage data. Supplygrid referred to the business.gov.au website to consider the programme guidance material in detail. The company decided that there were some aspects of its proposed R&D that it was

still unsure of and decided to apply for an Advance Finding to get a formal ruling on the eligibility of its proposed R&D activities. To help Innovation and Science Australia to understand the issues clearly, Supplygrid were very careful to describe the activities in the Advance Finding application in detail and to attach copies of its search records to support its case. Innovation and Science Australia considered the Supplygrid Advance Finding application and assessed the proposed core and supporting R&D activities to be eligible.

Companies that are unsure whether their activities are eligible under the R&D Tax Incentive may apply for an Advance Finding. An Advance Finding[18] provides certainty of the eligibility of activities to companies registering for the R&D Tax Incentive. When a company submits an Advance Finding application, the activities described in the application will be fully assessed by Innovation and Science Australia against the legislative requirements. If the application is found to satisfy all of the requirements, an Advance Finding certificate will be provided that binds Innovation and Science Australia and the Tax Commissioner to recognise the specified activities as eligible for a period of up to three years. The time involved in the process for an Advance Finding will depend on the company's individual circumstances and on workload within the department.

Companies that receive an Advance Finding certificate are still required to register R&D activities after the end of each income year in which the activity is conducted and to make the relevant claims in its tax returns. It is important to recognise that the finding on the activities applies only to the extent that the registered activities are the same as those on which the finding was made.

Project planning

Supplygrid embarked on the design process to develop a software system that could provide real time analytics of smart meter data to customers through a mobile app. The company contracted a software consultant to assist in developing the software system.

The consultant was advised the software needed to quickly record the data and enable rapid extraction to ensure consumption readings in real time. It was also necessary for the software to be compatible with Supplygrid's current smart meters and for the data to be easily transferred and visualised on a mobile app.

The key technical issue the company faced was how it could collect and analyse large data sets from household smart meters in real time. As the technology did not already exist and the software consultant did not know how to develop the software on the basis of its existing knowledge and expertise, a literature search was initiated. The outcome of that literature search did not identify the necessary information for the consultant to develop the storage and search algorithms to fulfil the objectives. As a result, it was clear the consultant needed to 'blue sky' some possible solutions, and undertake hypothesis-driven experimental testing of different algorithmic approaches to arrive at an eventual solution to the problem.

[18] The application to apply for an Advance Finding can be found on the business.gov.au website.

Core R&D Activity 1: *Experimental development of new algorithms for real time analysis of large datasets*

This activity commenced upon discovering the algorithms could not be developed by using routine software development techniques.

To deliver on the project objectives, Supplygrid needed to conduct a series of hypothesis-driven experiments to develop and test storage and search algorithms. During this process, the software consultant worked with Supplygrid and tested several versions of the coded algorithms against the customer survey data. As the experimentation progressed, and despite the many dead ends the activity encountered where the search algorithms were not reliable or fast enough, Supplygrid became satisfied that the accuracy of the consumer consumption calculations (that were dependent on the prototype storage and search algorithms) would arrive at an acceptable level. Through the successive experiments, the company eventually developed the prototype algorithms to a point where they could collect, organise and analyse large datasets of customers every 15 minutes with an accuracy of 98 per cent.

The R&D team took the experimentally developed algorithms and used routine development activities to build a prototype system.

The R&D team demonstrated the prototype software system to the Board, with the assistance of a specially developed graphical user interface (GUI). Although the newly developed technology was feasible at a small scale, such as at the suburb level, the Board decided that it could not feasibly service the company's entire customer portfolio with the capabilities of current data storage technology. For this reason, the Board discontinued the R&D project until further advances in data storage were developed.

Although the project was unsuccessful in developing the new service offering, the company was still able to claim R&D expenditure through the R&D Tax Incentive.

Supplygrid registered the experiments to develop the storage and search algorithms as a core R&D activity on the basis that:

- the literature reviews and industry consultation could not identify or develop algorithms that could achieve the desired outcome without experimentation (that is, the outcome was not already known and could not be determined in advance on the basis of current knowledge, information or experience), and
- the experiments conducted by the software consultant engaged by Supplygrid involved a systematic progression of work that was based on established science and proceeded from hypotheses to experiments that were observed and evaluated and led to logical conclusions

the experimental activities were undertaken for the purpose of generating new knowledge in the form of the prototype storage and search algorithms.

Supporting R&D Activity 1: *literature reviews and industry consultation*

The literature reviews and industry consultations searching for existing storage and search algorithm solutions to deliver the functionality the company needed were not experimental. However, some were used by Supplygrid to identify approaches to storage and search algorithm design that the company could experiment with in the core R&D activity. This meant that the relevant literature reviews and consultations

were directly related to the experimentation being conducted in the core R&D activity. As a result, the company self-assessed that those literature reviews and industry consultations could be registered as a supporting R&D activity. This was because those reviews and consultations were directly related to the experimentation in core R&D activity 1.

Supporting R&D Activity 2: *Gathering sample set of usage data*

To test whether the algorithms developed in core R&D activity 1 could facilitate the correct analysis of customer electricity consumption, it was necessary to have a test sample of a large customer data set available.

The company approached customers in several suburbs to ascertain interest in participating in the development of the prototype service. The majority of customers that were approached agreed to participate and returned completed surveys of their electricity usage patterns. The surveys sought detailed electrical appliance usage across a number of commonly owned high-energy appliances that would be compared against the customers' actual electrical consumption. The surveys provided a data set that would be used to simulate the type of data that the company could receive directly from smart meters in the final version of the service. This method was used to provide access to low cost test data.

Supplygrid was interested in claiming the expenditure on the survey and was aware that market research activities are excluded from constituting a core R&D activity. Activities that are excluded from being core R&D activities may still be claimed as supporting R&D activities if they can demonstrate that they are:

- directly related to a core R&D activity, and
- undertaken for the dominant purpose of supporting that core R&D activity.

After reviewing the requirements through the department's guidance on business.gov.au, Supplygrid self-assessed this activity as a supporting R&D activity on the basis that the data collected from the customer survey was:

- directly related to core R&D activity 1 in that it was used to generate test data that was needed to experimentally develop the algorithms in that activity, and
- conducted for the dominant purpose of supporting core R&D activity 1 as it was exclusively undertaken to supply the test data that was needed to evaluate the software system.

Neither a core nor a supporting R&D activity: *Development of the demonstration prototype and GUI for a mobile app*

Once the problems of developing the algorithms were overcome, the company used routine software development techniques to create a demonstration prototype with a GUI in a mobile app. The prototype was used to showcase the service to Supplygrid's Board. As Supplygrid did not have any expertise in software development, it contracted an IT company to undertake the work.

The IT company was able to take the experimentally derived algorithms and build them into a demonstration prototype using routine software development techniques. In regards to the GUI component, the IT company used routine techniques to make minor tweaks to one of its existing products to supply a GUI that met Supplygrid's specifications.

While the demonstration prototype app was essential to showcase a prospective consumer product, it was not directly related to the conduct of experimental activities in a core R&D activity. Consequently, the development of the prototype was not an eligible activity under the R&D Tax Incentive and was not registered.

Supplygrid also conducted a market survey on whether the demonstration app's GUI was attractive to customers and whether consumers would prospectively find the mobile app useful. Prior to applying for the Advance Finding, the company familiarised itself with the list of excluded activities[19] and noted that market research was excluded from being a core R&D activity.

While this exclusion does not preclude an activity from being an eligible supporting R&D activity, in this case the activity was not directly related to core R&D activity 1, and the dominant purpose of conducting the activity was for commercial purposes. Consequently, Supplygrid self-assessed that the activity would not be eligible under the R&D Tax Incentive.

In summary, SupplyGrid recognised that neither the:

- routine software development to incorporate the new algorithms into the prototype demonstration app including the GUI, or
- market research on the GUI design

were eligible R&D activities under the R&D Tax Incentive and were not registered.

What documentation did Supplygrid keep?

Prior to undertaking its R&D activities, the company decided to contact the department's Contact Centre for assistance regarding record keeping obligations.

After the general discussion with the Contact Centre, the company was directed to *Compliance Readiness: The Importance of Record Keeping and the Preparation of Registrations and Applications* on the business.gov.au website for further consideration. After reviewing the guidance, Supplygrid was able to identify the types of records it needed in order to be 'compliance ready' for the R&D Tax Incentive. The records were of use to the company when it filled out its Advance Finding application and its later registration of R&D activities.

The company documented its literature research and industry consultations, that identified that a solution to the big data software analysis problem did not currently exist and could not be resolved in advance based on existing knowledge, information or experience. This documentation also included the range of existing algorithm approaches that informed the development of the new algorithms in the core R&D activity.

In addition, Supplygrid maintained a detailed project plan which included the project objectives, experimental methodology and milestones. When conducting R&D activities, the company kept records that documented its methods, results, analysis and conclusions of the experiments. The company also kept all foundational

[19] The list of excluded core R&D activities and commentary on their meaning may be found on page 25 – 40 of the *R&D Tax Incentive: A Guide to Interpretation* which is available on the business.gov.au website.

documents outlining the agreements with the contractors and any project reports provided by the contractors.

Supplygrid was careful to keep documents relating to the R&D activities undertaken by the contractors including:

- correspondence and emails with the contractors that described the nature of the collaboration, the design of the experiments, failed experimental outcomes and the progress achieved and
- all invoices including details of the work undertaken that provided:
  - dates of the work undertaken,
  - sufficient detail to establish the necessary links to any R&D expenditure incurred, and
  - descriptions of the activities performed by the contractors which linked to the costs of a particular R&D activity.

Commentary

Record keeping

It is important to maintain records to demonstrate to both the department and the ATO that:

- an eligible R&D activity was conducted,
- the company incurred eligible expenditure in relation to those activities, and
- the R&D activities and expenditure met all legislative requirements under the programme.

To show that core R&D activities have met the legislative requirements, companies should include documents that:

- state the knowledge or technology that existed when the R&D activity was undertaken and what new knowledge was being sought through the R&D activity.
- evidence or documents that show the knowledge or information was not already publicly available (e.g. literature review, patent searches and industry expert consultation),
- describe the hypotheses, the experiments undertaken to test the hypotheses, the result and analysis of the experiments, and
- record any changes to the hypotheses or experiments throughout the course of the R&D activity.

When making a claim for a notional deduction with the ATO, companies must ensure that they have adequate records to demonstrate the following:

- how the expenditure incurred relates to the registered R&D activities,
- how expenditure has been apportioned between eligible R&D activities and ineligible activities,
- that the company receives the major benefit from the R&D activities,
- when amounts have been paid to associates, and
  - how required adjustments have been calculated as a result of either: receiving a government recoupment (clawback), or
  - producing a marketable product (feedstock adjustments).

A valid record for the purposes of claiming the R&D Tax Incentive is any record that verifies or contributes to calculating the claim made. Records must be in English (or easily translated into English). Records can be stored in either paper or electronic form.

The R&D Tax Incentive • *Energy Guidance*
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