

The Treasury

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- [1] 9(2)(a) - to protect the privacy of natural persons, including deceased people
- [2] 9(2)(f)(iv) - to maintain the current constitutional conventions protecting the confidentiality of advice tendered by ministers and officials
- [3] 9(2)(g)(i) - to maintain the effective conduct of public affairs through the free and frank expression of opinions
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In preparing this Information Release, the Treasury has considered the public interest considerations in section 9(1) of the Official Information Act.

Vote Energy

Four-year Budget Plan

Version [3]

21 February 2011

Submitted by:

Ministry of Economic Development

Section 1: New Baseline and Summary of Changes

Direction of Change

Vote: Energy delivers to four goals, which contribute to the Government's six policy areas, as follows:

| Vote: Energy goal | Related Government policy area |
|--|---|
| Build world class petroleum and minerals institutions | Strengthening our tax system; Better, smarter, public services |
| Accelerate development and extracting higher returns from the Crown's resource portfolio | Strengthening our tax system; Better science, innovation, and trade |
| Support the operation of efficient and effective energy markets | Removing red tape and unnecessary regulation; Strengthening our tax system; Better science, innovation, and trade; Investing significantly in productive infrastructure |
| Promote energy efficiency and renewable energy | Strengthening our tax system; Better science, innovation, and trade; Investing significantly in productive infrastructure |

[2]

Many of the outputs will take more than one or two years to complete, even while they form an important part of the work programme of the Vote for 2011.

This four year plan outlines the longer term plan for the Vote, which includes a number of areas of work which the Ministry sees as needing completion over the next four years, and the way in which the work programme of the Vote will contribute to the Government's policy areas and the Government's goal of faster, sustainable growth.

By way of summary, the priorities of Vote: Energy, over the next four years and the major outputs contributing to the priorities, are as follows:

Resources priorities

- Implement strategies to accelerate development and extract higher returns from the Crown's resource portfolio, which involves:
 - Implementing the petroleum knowledge investment strategy
 - Developing policy for emerging and under-exploited resources (e.g. iron sands, lignite, manganese nodules, methane hydrates)
 - Building world class petroleum and minerals institutions, which involves:
 - Implementing the agency capability review
 - Revising the legislation, regulations and policy governing the management of the Crown's mineral estate

- Reviewing the legislation, policy, and operations in place to support health, safety and environmental protection during petroleum and mineral related activities
- Developing policy on natural resources and the management of conflicting uses of land and ocean
- Developing policy to enable a long-term Crown-iwi relationship in the development and administration of energy and resources policy

Energy priorities

- Support the operation of efficient and effective energy markets, which involves:
 - Fully implementing the electricity market reforms
- Promote energy efficiency and renewable energy, which involves:
 - Continuing to roll out the Warm Up New Zealand: Heat Smart programme
 - Developing a new programme of sufficient scale to support business energy efficiency

No programme changes are required to ensure the Vote delivers to the Government's six policy areas.

Overall Impact

| Operating | Impact (\$000s) | | | | |
|----------------------------------|-----------------|---------|---------|---------|---------|
| | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
| Current Baseline | 426,475 | 284,228 | 175,472 | 145,511 | 144,231 |
| Cost of new/increased activities | 20 | 120 | 120 | 120 | 120 |
| Amount reprioritised | (520) | (120) | (120) | (120) | (120) |
| New baseline | 425,975 | 284,228 | 175,472 | 145,511 | 144,231 |

| Capital | Impact (\$000s) | | | | |
|--|-----------------|---------|---------|---------|---------|
| | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 |
| Capital proposals seeking decisions in Budget 2011 | - | - | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| Capital proposals seeking new funding in Budget 2011. | - | - | - | - | - |
|---|---|---|---|---|---|

Section 2: Vote Priorities and Pressures

Vote: Energy four year plan

As part of the core business of the Vote, the Ministry monitors and provides the Minister advice on the down stream gas industry, monitors the petroleum industry and electricity industry, manages New Zealand's international energy obligations, and monitors crown entities funded through the Vote.

All these outputs relate to the Government's policy areas, specifically: removing red tape and unnecessary regulation; strengthening our tax system; better science, innovation, and trade; investing significantly in productive infrastructure and better, smarter, public service. These outputs are not described in any further detail in this section.

This section describes the major projects the Ministry will begin, and envisages will be complete, over the next four years. The following table lays out the major projects and the related Government policy area. In order to keep the table simple and easy to read, the related Vote: Energy goal is not included.

| Policy Area | Output | Estimated year of completion | Related Government policy area |
|-------------|---|------------------------------|--|
| Petroleum | Structured approach to release of acreage and investment promotion that maximises investor interest | 2011 | Strengthening our tax system; Better, smarter, public services; Better science, innovation, and trade |
| | Development of policy on the implications of new finds, including macro economics of production, fiscal implications, and issues for supply and demand of gas | 2012 | Better science, innovation, and trade; Removing red tape and unnecessary regulation; Strengthening our tax system; Better science, innovation, and trade |
| | Investment strategy to maintain production in the Taranaki Basin and foster commercial discoveries in frontier basins | 2014 | Better science, innovation, and trade; Strengthening our tax system; Better, smarter, public services; Better science, innovation, and trade |

| | | | |
|-------------------------------------|---|----------------------|--|
| | Newly implemented annual review of monitoring and evaluation of seismic data acquisition and recommendations made | 2012-14 and outyears | Better, smarter, public services; Better science, innovation, and trade |
| Liquid and alternative fuels | Review of liquid fuel specifications | 2011-12 | Removing red tape and unnecessary regulation; Better science, innovation, and trade |
| | Development of policy on bio-diesel | 2011 | Better science, innovation, and trade; Removing red tape and unnecessary regulation; Strengthening our tax system; |
| Gas | [2][3] | 2013 | Investing significantly in productive infrastructure; Better science, innovation, and trade |
| | Development of policy on carbon capture and storage | 2013 | Better science, innovation, and trade; Removing red tape and unnecessary regulation; Strengthening our tax system |
| Mineral resources | Development of policy on competition for underground resources (Coal Seam Gas vs Underground Coal Gasification) | 2011-12 | Removing red tape and unnecessary regulation; Strengthening our tax system; Better science, innovation, and trade |
| | Management of issues arising from Royal Commission of Inquiry in to the Pike River mining disaster | 2013 | Removing red tape and unnecessary regulation; Strengthening our tax system; Better, smarter, public services; |
| | Development of policy on emerging and under-exploited resources completed (e.g. iron sands, lignite, manganese nodules, methane hydrates) | 2011-13 | Better science, innovation, and trade; Removing red tape and unnecessary regulation; Strengthening our tax system |
| | Development of policy following results of mineral surveys (Northland, West Coast) | 2012 | Better science, innovation, and trade; Removing red tape and unnecessary regulation; Strengthening our tax system |

| | | | |
|---|--|---------|---|
| Biological resources | Development of policy on implementing the Access and Benefit Sharing protocol | 2012 | Strengthening our tax system; Better science, innovation, and trade |
| Institutions for the management of the Crown's mineral estate | Legislation, regulations and policy governing the Crown's mineral estate revised and introduced | 2011 | Removing red tape and unnecessary regulation; Better, smarter, public service; Strengthening our tax system |
| | Resource royalties reviewed and revised; this work could be given a strong impetus should the Government revise the status of mineral resource SOEs. | 2012 | Strengthening our tax system |
| | Completion of changes required to Crown Minerals delivery for more effective and efficient management of the Crown's resource estate | 2014 | Better, smarter, public services |
| Relationship of resource estate development, and environmental management/conservation | Development of policy on natural resources and managing conflicting uses of land/ocean | 2014 | Strengthening our tax system; Better, smarter, public services; Better science, innovation, and trade |
| | [2][3] | 2014 | Better science, innovation, and trade |
| | Second opinion advice: diverse environmental issues resolved: Foreshore and seabed legislation, health and safety legislation, Phase 2 of the RMA reforms complete, amendment legislation to ensure improved water management, WAI 262, WAI 796 (these take varying amounts, sometimes significant amounts, of MED time) | 2011-14 | Removing red tape and unnecessary regulation; Better, smarter, public services; Better science, innovation, and trade |
| Electricity system | Ensuring effective implementation of the 2009 electricity market review, including the specific matters required in legislation. | 2011 | Investing significantly in productive infrastructure |
| | Development of policy options on emerging technologies and their coordination with the electricity system and implementation of preferred approach | 2013-14 | Better science, innovation, and trade; Removing red tape and unnecessary regulation; Investing significantly in productive infrastructure |

| | | | |
|--------------------------------|--|---------------------------------------|---|
| | Evaluation complete on the review of the electricity system and recommendations made | Ongoing with report back by exception | Removing red tape and unnecessary regulation; Investing significantly in productive infrastructure |
| | Development of policy options on cyber security of electricity system and implementation of preferred approach | 2013-14 | Better science, innovation, and trade; Investing significantly in productive infrastructure |
| Energy efficiency | Report back on evaluation of Insulation programme complete | 2011 | Investing significantly in productive infrastructure |
| | Development of policy on NZ's international oil obligations and domestic storage | 2011 | Investing significantly in productive infrastructure |
| | Policy implemented for efficient support of business/industry and commercial building energy efficiency | 2011 | Better science, innovation, and trade |
| | Government investment in insulation in the housing stock complete | 2013 | Investing significantly in productive infrastructure |
| Renewable energy supply | Development of policy on renewable energy's contribution to the achievement of the Government's energy goals | 2011 | Removing red tape and unnecessary regulation; Investing significantly in productive infrastructure; Better science, innovation, and trade |

Lowest value programmes

A line-by-line review of the Vote was undertaken in 2009 and the appropriations funding energy efficiency and renewable energy policy objectives were evaluated in 2010, and low value funding was re-prioritised or offered as savings.

The development of this Budget Plan has not identified any more programmes of low value relative to Government priorities. However, Vote Energy can offer up savings \$500,000 in 2010/11, which had been appropriated for policy development.

Vote: Energy pressures

The Vote is not affected by inflation/price pressure or demographic changes. There are no, one-off pressures expected in the forecast period. The Vote will be affected by wage pressures, but this is being managed and is not expected to affect the Vote's ability to deliver its outputs or to the Government's policy areas as indicated in this report.

Section 3: Proposed Changes for Budget 2011

New or increased activity

IEA and IRENA fees

A small reprioritisation is required to meet the Government's obligation to contribute to the International Energy Agency (IEA) implementing agreements (additional \$20,000) and to support the International Renewable Energy Agency (IRENA \$100,000 membership fee).

The IRENA fees for 2010/11 are met by the Ministry of Foreign Affairs and Trade, but the obligation transfers to Vote: Energy in subsequent years.

The activity contributes to the Government policy area: Investing significantly in productive infrastructure.

Security management

A new multi-year appropriation is proposed to provide funding for the management of emergency events by the System Operator¹, if required. The appropriation is proposed to be \$6 million per annum. It will commence from the 2012/13 financial year, after the existing multi-year appropriation used to fund the costs of implementing emergency measures expires at the end of 2011/12. The proposed scope of the appropriation is to cover:

- Increased monitoring and analysis in the event of an emerging security situation
- Increased management responsibilities during security events
- Planning and running and emergency conservation campaign, if needed.

An appropriation for 2012/13 is sought now rather than in 2012 so that the Electricity Authority has certainty that ongoing funding will be available for contracting with the System Operator for delivery of emergency management services. Without the appropriation there will be no funding from 2012/13 onwards for costs incurred in the System Operator responding to emerging security situation and security events. In such circumstances, an urgent request for a new appropriation would be required each time there is an emerging security event.

These measures relate to the Government policy area of investing significantly in productive infrastructure. The appropriation would be funded by the levy on the electricity industry, resulting in a fiscally neutral increase in appropriations for the Crown. The appropriation would not be used unless a security event emerges during a year and any amount would not be levied unless used, in which case it would be included in the reconciliation of the levy at the end of that year.

¹ The System Operator has responsibilities for emergency management, including monitoring security levels and taking progressively escalating actions, as necessary.

Petroleum Action Plan – Petroleum Knowledge Investment Strategy

The rate of exploration and appraisal of petroleum basins in New Zealand is low. A higher rate of exploration is considered necessary to maximise the value to the Crown of its potentially very-valuable petroleum resources. However, investors are unwilling to commit exploration and appraisal capital to New Zealand because of the limited information that is available about New Zealand's petroleum geology – particularly beyond the Taranaki basin. The international market for exploration investment is very competitive, and the same investors targeted for New Zealand exploration opportunities can choose to instead invest in other jurisdictions that are closer to home and for which better geological information exists.

In light of these circumstances, the Government has acquired pre-commercial seismic information and made it freely available to potential investors since 2005, investing around \$35m in the 5 year period to 2010/11. This is one of the very few levers that the Government can use to stimulate investment, given current fiscal settings and permit terms.

Previous investments have produced significant new geological information about, and underpinned block offers in, the East Coast, Great South, Raukumara and Reinga basins.² They have resulted in new exploration activity by very large international investors including ExxonMobil, OMV, Petrobras, and Anadarko. This has introduced substantial additional liquidity into the domestic exploration market; [4]

It is unlikely that any of this investment would have been made if the Government had not first invested \$5 million acquiring the pre-commercial seismic data.

It is proposed that the Government continue to acquire seismic information, with an annual appropriation of \$8 million. This figure is slightly above the historical annual average of \$7 million. The proposed level of investment would enable seismic acquisition to continue at a similar scale to the past five years, and would also allow significant additional value to be derived (through a substantial decrease in business search costs) by linking historical technical and geological data that are currently held in different parts of government. This would, effectively, enable the Ministry of Economic Development and the Institute of Geological and Nuclear Sciences to continue with the *Petroleum Exploration Geoscience Initiative* (PEGI) pilot project. These two initiatives are at the centre of the petroleum knowledge investment strategy.

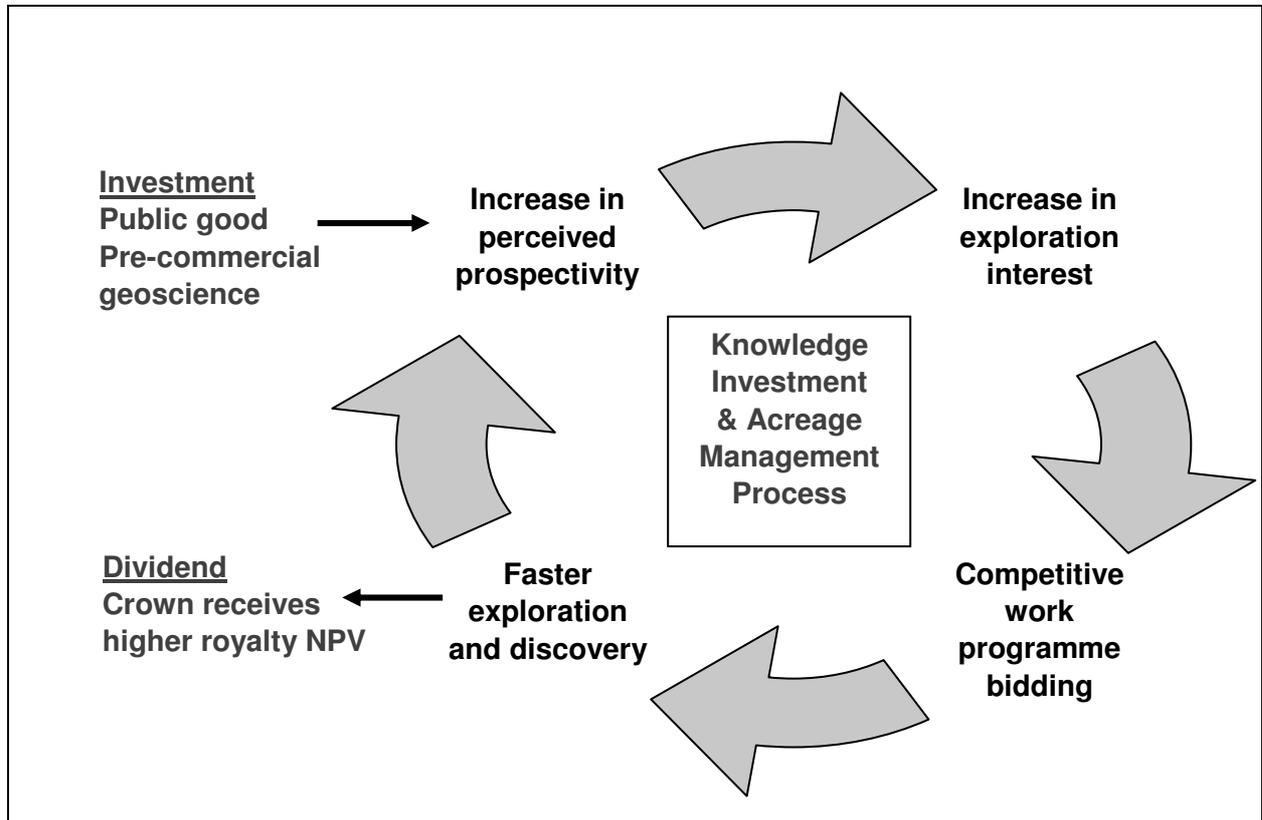
[2]

In order to be sure Government is not crowding out the private sector, the acquisition of seismic information will occur in the pre-commercial phase - that is, initial surveys which have public good characteristics and which would not otherwise be funded by private sector investors.

² Additional basins have subsequently been surveyed from the same appropriation; however the government is yet to incorporate the processed data into a blocks offer process.

The petroleum knowledge investment strategy will guide Government investment in pre-commercial information (including seismic data) over the medium term, in order to develop a knowledge base about frontier petroleum basins, crowd-in private sector exploration capital, and foster significant additional exploration activity. This is a necessary condition to drive up the net present value of the Crown's royalty income from successful commercial discoveries.

Fig 1 Programme Logic: The relationship between investment and Crown royalty return



The costs, benefits, and risks of the proposal

The proposal is expected to cost \$8 million per annum. The proposal is expected to generate benefits in excess of \$8 million per annum.

MED has estimated the expected value of the investment on a probabilistic basis, using a simulation model to assess the difference in discovery outcomes under 'with' and 'without' scenarios, and a financial model to attribute a monetary value to the change in commercial outcomes arising from that difference.

We have modelled the effect of implementing the investment strategy as one additional frontier-basin exploration well being drilled each year. This proxy captures some, but by no means all, of the expected outcomes from investment. The modelling results indicate that the expected marginal benefit to the Crown (the change in the net present value of future royalties) of the additional well is \$8.0 million.³ This figure reflects the model's assumption

³ The modelling indicates that an additional well has a 10 percent probability of generating \$11.0M or more in additional benefit to the Crown, a 50 percent probability of generating \$8.0M or more, and a

that the probability of successful drilling outcomes increases over time as more data are acquired. However, it does not capture the observed tendency for drilling successes to crowd-in additional investment in exploration – which could be expected to further increase the net present value of future Crown royalty income. Importantly, it also excludes the effect of improved data systems and software inducing additional exploration by lowering investor search costs. On this basis, we consider the \$8.0 million to be a very conservative mid-point estimate once the full range of benefits is considered.

There is a risk that the strategy may not catalyse at least one additional frontier-basin exploration well being drilled in every year. Given the lack of ‘liquidity’ in the domestic market, this could be caused by, for example, weather delays to survey acquisition or difficulties in accessing appropriate vessels. It is also possible that acquired information serves to change the geological outlook of certain areas from ‘seemingly-prospective’ to ‘not prospective’ – and, in doing so, averts private investment being sunk on unproductive exploration and resulting dry-wells. In shortening the cumulative exploration process, such outcomes would enable the Crown and industry to focus investments on other, more prospective parts of New Zealand’s enormous, largely frontier EEZ.

The Ministry intends to introduce careful monitoring and evaluation of the purchase of seismic information that accounts for these considerations. It is confident it can measure outputs and outcomes so to ascertain relatively quickly if the policy is working as intended (see ‘success measures’ section below).

The outputs to be bought and how they connect to Government priorities and outcomes

Outputs

1. Pre-commercial seismic information (for example, two dimensional seismic reflection surveys, prospectivity mapping, and outcrop studies) that has public good characteristics.
2. Software and systems which link, improve the accessibility of, and lower search costs to, existing data held by Crown Minerals and other parts of government (e.g. NIWA and GNS).

The knowledge investment strategy is a key plank of the Petroleum Action Plan, which seeks to develop the full potential of our petroleum resources. In turn, petroleum is identified as a high-priority sector under the *science, innovation and trade* driver of the Economic Growth Agenda.

Accordingly, implementation of the knowledge investment strategy is closely aligned with the economic priorities of the Government.

Why you believe the proposal is good value for money

The proposal has a benefit/cost ratio in excess of 1 under modest assumptions about the change in exploration activity arising from the investment, and the corresponding impact on the timing of discovery and development of new hydrocarbon resources.

90 percent probability of \$4.0M or more. See MED’s 2011 *Reviewing the Royalty Regime for Petroleum* discussion paper for a full discussion of the model and method.

Previous investments in seismic data have catalysed additional, private sector exploration investment in the^[4] The information that results from these investment programmes has been submitted to the Crown at the completion of exploration activities. This means that even where exploration does not bear new commercial hydrocarbon deposits that will directly generate additional royalty income, the Crown earns a significant return in the form of valuable new information to better understand its resource base. Furthermore, after several years it makes these data publically available and so can attract further investment from prospective new investors.

Options analysis

Alternative mechanisms for increasing the level of exploration are available, in addition to the 'do nothing' option. Tax incentives and grants are two options.

A number of overseas jurisdictions encourage exploration through the direct subsidisation of seismic data collection by private businesses. The option has some appeal, as it ensures that government funding is invested in seismic outputs that are, by definition, of value to exploration businesses. However, because of the pre-commercial nature of the exploration seismic information, it is difficult to reconcile the government's desire to make the resulting outputs publically available with a mechanism that requires private sector co-investment. This is particularly so when there are more certain options available to potential investors in other jurisdictions.

- Quantified targets and the measures of success

A previous Cabinet paper on seismic investment, which was endorsed by the Treasury, gives the following success measures [EDC (04) 139 refers]:

1. **Timeliness:** Within 4 months of the completion of acquisition and processing, the data will be integrated into the announcement of a block offer for the petroleum basin surveyed.
2. **Quantity:** Two 2D seismic surveys will be completed in each financial year in basins identified as priorities.
3. **Quality:** Exploration bids received in relation to blocks offers based on government-acquired 2D seismic data will be required to submit work programmes committing to drilling exploration wells in the first or second year of the permit.

We propose to retain 'timeliness', 'quantity' and 'quality' as our success measures. However, we propose to modify the specific measures in light of the knowledge investment strategy's focus on managing the exploration estate as a portfolio, rather than through a basin-by-basin blocks offer approach. The implications for our measures are as follows:

- 1#: **Timeliness:** Within 12 months of completing the acquisition, processing, and interpretation of the data, it will be integrated into the announcement of the next scheduled blocks offer round.
- 2#: **Quantity:** 2D seismic surveys and/or data (re)interpretation will be completed for at least two basins identified as targets for the next blocks offer round.
- 3#: **Quality:** Exploration bids received in relation to blocks offers based on government-acquired 2D seismic data or data interpretation will produce additional exploration

interest, and result in larger and more productive exploration work programmes, than would have been the case in the absence of that information.

- What would be the consequence if no additional resources were provided?

In the absence of continued public investment in pre-commercial geoscience, New Zealand will be less attractive to new investment in petroleum exploration and production. *Ceteris paribus* this will result in fewer exploration permits being taken up, a smaller aggregate exploration work programme being delivered, less information being submitted with the Crown and, on a probabilistic basis, fewer commercial discoveries being made. This will manifest as the production of a declining volume of hydrocarbons. In turn, this will impact on net exports, aggregate investment, and the expected present value of future Crown royalty income.

However for now, in the absence of agreement on possible funding sources, this initiative will be withheld from the Budget 2011 process.

Contestable Fund for Deployment of Marine Energy Devices

The existing multi-year appropriation (MYA) for this item expires on 30th June 2011. The remaining funds have been committed, however the related contracts contain milestone requirements that impact on actual payment of the funding, extending over future years. A further multi-year appropriation is therefore needed to enable these commitments to be met and a proposal to transfer remaining unspent funding from the existing MYA to a new MYA will be made as part of the Budget 2011 process.

Section 4: Summary of Financial Movements

Please refer to the attached reports generated from CFISnet which detail the changes to appropriations (including new appropriations) which are required to implement all of the proposed changes in section 3.