ICELAND'S FUTURE:
A CHANGED APPROACH TO NATURAL RESOURCES

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Summary

This paper argues the case for a radical rethink and a new approach to the exploitation of Iceland's natural resources. The present exploitation of Iceland's renewable energy resources for aluminium smelting is outmoded. It over exploits and under values the natural energy resource to the detriment of the economy, society and the environment for the next two generations.

Iceland should aspire to be the laboratory and the exemplar of real sustainable development of natural resources in the world. A new vision is needed based on the care for, value and use of the natural resources of Iceland sustainably to benefit this and many future generations.

To bring this about there must be a change in mind set based on the new vision and not on exploitation. And, a new plan is necessary comprising of 8 key ingredients:

1. **Developing a National Natural Resource Strategy**
2. **Conserving the best of Iceland's environment**
3. **Restoring the land**
4. **Developing the intellectual base**
5. **Skilling the future**
6. **Adding value to raw materials**
7. **Changing behaviour towards natural resources, and**
8. **Improving administration.**

Political leaders are challenged to instigate a debate amongst all of nation's school children on Iceland's future for the next generations.

Introduction

This paper arises from many discussions in Iceland over the years, and during my most recent visit in April 2009. It was presented at a public address to an audience of 90 people in Reykjavik on 17 April hosted by Landvernd and Landgrædsla rikisins. Its sole purpose is to stimulate debate from an external perspective on Iceland's future environment, especially in the context of the global credit crunch and its very severe impact on the Icelandic economy and currency. It also should be read in the light of the decision by the Althingi on 17 April to approve the next package of measures to allow the Helgavik smelter to go ahead, and in the light of the results of the election to the Althingi on 27 April.

The context

There has been a long standing debate about the type and location of economic development in Iceland and on the protection of nature. It has often polarised into a

confrontation between jobs and nature, and between economic interests and environmental interests. The arguments came to a head in the debates about the then proposed Kárahnjúkar hydro-electric scheme and the associated Reyðarfjörður aluminium smelter development in the 1990s. Since the development was approved and its operation began, there have been other proposals for aluminium smelters, for example at Helgavik in the south west and at Husavik in the north east. Clearly, the debate about the future course of the economy is active and will continue. The collapse of the banks and the stringent conditions imposed by the International Monetary Fund and the expectation that jobs will be created to balance those that have been lost and others that will inevitably be lost means that large scale projects are to the forefront of the minds of the population and in the action of politicians. Indeed, a few hours after the talk I gave on 17 April the Althingi decided by cross party support to approve the package of measures for the construction of the Helgavik smelter and the associated electricity power contract.

The political will of Iceland seems to favour further exploitation of natural energy resources for economic development by multi-national aluminium producing companies. And yet, there is still need for debate and a move from the highly polarised issues to a greater consensus. This plea is one which has been made many times in Iceland since the agreement on independence in 1944.

The old approach

There is no doubt that there is a need to diversify the economy from its over dependence on the export of fish. It is though worth noting that fish exports are a diversified commodity and the fishing industry in Iceland is by no means a single product industry, compared, for example, with the aluminium smelting industry. The development of aluminium smelters and the promotion of Iceland as a tourism destination have certainly helped to provide a lower level of dependency on fish exports. However, economic analysis has shown that the extensive growth of one single sector, the aluminium sector, has in fact made Iceland's economy more exposed to external shocks than it was some 10-15 years ago. There is also no doubt that there remains a great deal of untapped natural energy resource in the rivers and in the geothermal hotspots.

But, there is clearly identifiable damage to the natural environment due to unplanned and unregulated exploitation of natural energy sources that could easily be foreseen but have been ignored. Most important the natural resources of Iceland have been undervalued in relation to their international worth and have therefore resulted in huge subsidies to the companies undertaking the developments and for the relatively small numbers of jobs that have been created. The power has been sold to international commercial businesses under long-term contracts which reduce the nation's capacity to change course in the next 30-40 years. It is also a matter of note that the strategic assessments of natural resources, such as the Master Plans for Hydro and Geothermal Power Energy (published at the end of 2003) are focussed on resource exploitation and do not include any valuations of the overall costs and benefits, including putting an objective value on the natural resources. These approaches have clearly damaged Iceland's reputation as a leading green economy and may have also harmed its ability to promote tourism.

Aluminium smelters provide a considerable number of construction and operational jobs. Landsvirkjun estimate that around 1million tonnes of aluminium will be produced from Icelandic smelters by 2014. Much is made of the issue of renewable energy as the power source for the smelters in Iceland compared with other fuels used in some other parts of the world. However, the fact is that the fuel source for the reduction process in the vast majority of aluminium in the original producing countries is hydro electricity. There are clearly economic benefits, but the balancing costs have not been fully exposed and certainly not admitted by the Government of Iceland or by Landsvirkjun.

A number of key issues need to be recognized

1. In modern assessments of economic development, it is the norm to take into account the **whole life time costs and benefits** of the project before decisions are made. For the Icelandic projects, the environmental signature of building the dams and power lines, of constructing the smelter, of mining and reducing the bauxite to alumina, of transporting the raw material by sea and exporting the finished product, have not been taken into account. All of these activities will release carbon and other greenhouse gases into the atmosphere, all require energy and not all of it will be from renewable resources, especially the fuel for mining, reduction, and transport, and the energy required for the concrete and metallic structures. It is reasonable to conclude therefore that the projects in their construction and operation are not as clean as it is claimed by the government interests and the developers in Iceland and in the raw material supply countries.

2. A major ingredient in the production of aluminium is electricity. The price of the electricity contract is the most significant consideration in the decision by a smelter developer on the location for development. Obviously, the lower the price the developer has to pay, the more attractive is the location and the higher their profitability. But, from the limited evidence that has been made available, this critical national **natural resource is substantially undervalued**. There is a great deal of rumour that the electricity price for the Reyðarfjörður smelter is low at around one third of the normal price. This has never been denied by Landsvirkjun and it is the public interest that these figures are made available. It is no excuse for Landsvirkjun to hide behind 'commercial confidentially' as the company is publicly owned and is responsible for this priceless national assessment. If the price is below world market price for hydro electricity, then there is a subsidy on behalf of the nation to the developer. This means that other activity using natural resources has to be foregone for the whole lifetime of the contract. This is in turn means that Iceland has given an interest-free grant to Alcoa and Alcan and their subsidiaries to persuade them to develop smelters in Iceland as opposed to in other countries.

3. In the case of the Kárahnjúkar dam there is clear evidence that critical information was suppressed by Landsvirkjun. Reports on the geological fissures in the area of the dam site were deliberately suppressed, presumably to ensure that there could be no objection to the dam site on geotechnical grounds.

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4. Open debate on the issue both within Iceland and internationally was discouraged, and indeed strongly resisted. In some instances, Landsvirkjun and the Icelandic government seemed to engender a culture of fear and bullying to try to stop people speaking out. When commentators from outside Iceland expressed concerns about the development at Kárahnjúkar they were ignored. Indeed, despite the international significance of the natural resources, Landsvirkjun seemed intensely irritated that commentators from other countries should have an opinion contrary to the company's view.

5. Experience from other countries on the use of large-scale industrial development in remote rural areas as a generator of demographically viable communities has been ignored. Scotland is a good case in point, as I have pointed out on many occasions over the past decade. There oil platform fabrication, aluminium smelting, pulp and paper mills located in remoter rural areas have had short life spans, and left high levels of unemployment, under utilised infrastructure and a migrant population out of sympathy with their local environment.

6. And, finally, there is a need to recognise that Iceland has increased its dependency on factors totally outside of its control or influence: world market prices for bauxite, competition in production from low cost locations, international companies with cost reduction strategies, and foreign labour for construction and management. This is somewhat ironic given the well-known independent stance of Icelanders over their history.

If an objective balanced assessment were to be undertaken, including all of the economic, financial, social, environmental factors, and opportunity costs and benefits, then the result would be very challenging to the political parties on whether their recent decisions are in the best interests of Iceland and its people for the immediate and longer term future.

It is now time to have a more balanced assessment and to admit the mistakes that have been made, so that the succeeding generations of Icelanders will not have to carry the heavy burden of the mismanagement and misuse of critical national natural resources. The old approach of natural resource exploitation to the maximum extent is outmoded.

This argument is not based on any personal antipathy to industrial development. On the contrary, I have spent most of my career in the economic development ministry of the government in Scotland encouraging development. My aim has always been to achieve the best deal for Scotland through the sustainable use of its natural resources and greatest long term benefits for its people. That is also the approach I take in Iceland.

The need for a new approach

A new approach is desperately needed. I consider this should be focused on achieving a balanced outcome benefitting the nation, its people, its economy and its environment: the essence of sustainable development.

The **vision** I propose is simple but fundamental:

> ***Iceland should care for, value and use its natural resources sustainably to benefit this and many future generations***

I interpret the key words as follows:
Care: is an active pursuit, generally meaning to conserve, but to preserve where necessary,
Value: is the cultural and economic value placed on a nation's resources
Use: for jobs, for enjoyment, for exports, for food etc but within the natural carrying capacity
Benefit: socially, economically, culturally, and educationally, and long lasting: that is they are sustainable in the true and strict sense originally defined over 20 years ago.

The outcome should be that:

> ***Iceland should aspire to be the laboratory and the best exemplar of real sustainable development of natural resources in the world***

The vision and outcome should be seen in the context of the national character of Iceland. My understanding, as a frequent visitor, is that Icelanders have an independent spirit, you have survived in adversity over the 1100 years since The Settlement, you are adaptable, have a deep understanding of your human history, have an entrepreneurial approach, and wish to have access to wide open spaces. You also recognise that you live in the global village, you connect to the rest of the world, and you are prepared to listen to opinions of others. So you are open to a more adaptable approach, with many facets, using the natural resources for the nation's benefit and ensuring that options for the future are not foreclosed or negotiated away.

The ingredients for the future
The vision I have set out requires implementation. To achieve this, I propose one fundamental change and a menu of 8 key ingredients. These are not quick fixes as the energy intensive industry seeks, but require long term commitment and will yield more sustainable and greater long term benefits.

As a priority there needs to be a fundamental change in the nation's mind set away from the exploitation of natural resources to their maximum level to an approach founded on caring for, valuing and using sustainably the country's natural resources. This will take time to achieve but will bring major benefits for the present and future generations, and should place Iceland as one of the leading nations of the world for sustainable development, one to be copied and one to be envied and emulated by other countries.

To implement this fundamental change in approach, I identify 8 key ingredients. These are not to pick and choose from, as all are equally important and essential ingredients of a whole package.

Ingredient 1 Developing a National Natural Resource Strategy
Why? Iceland's natural resources are assets which are undervalued by the government.

What?
First, it is essential to assess the distribution and quality of all natural resources (much of this exists through the work of various government departments and agencies) and to bring all of the material together in a coherent dossier.

Second, natural resources should be valued using the best economic and ecological methods so that this information can inform decisions about the use of resources.

Third, it is essential to argue the case for public support from the government for the provision of public goods: both in the generality and for specific goods and services. The key ones in an Icelandic context are as follows.

1) **Water** for human consumption at home and for potential to export to other countries is a vital and under valued resource in Iceland given the global need for increased access to water and the mismatch between the locations of supply and of consumption. Iceland could play a much greater contribution to poverty alleviation in the developing countries and aid its economy provided the water resources were exploited to a level within their natural renewal capacity and without detrimental effect to the environment and to ecological systems.
2) There is growing concern about **food biosecurity** as a result of poor husbandry practices in other countries, and **security of supply** given the increasing global demand arising from population increase and changing diets in developing nations. These raise the issue of producing more food for home consumption and for export to other countries. Iceland has plenty of potential to develop both its production for home markets and for exports (see below Ingredient 6).
3) Iceland has an international obligation as a signatory of the Convention on Biological Diversity and other international instruments for **biodiversity conservation and restoration** to conserve key species, habitats and ecosystems and to ensure that they are functioning effectively from an ecological perspective.
4) Continuing the programme of **land restoration and soil conservation** is justified to increase the nation's natural capital and to provide opportunities for increased food and fibre production and to reduce the costs of soils loss and the effects on transport through sand blow.
5) Safeguarding the nations' **special natural places** in recognition of its global uniqueness on a terrestrial continental plate spreading zone and the largely unspoilt areas of the highlands and other locations throughout the country and those that are of international heritage significance.
6) **Climate change mitigation and adaptation,** including taking a global lead in the transformation from fossil fuel to renewable energy sources and low carbon and

other greenhouse gas footprints; and also making the space to receive those species and associated habitats displaced by climate change further south, and building resilience to the predicted changes in weather regimes of temperature, storminess, and precipitation.

The strategy should also set out explicit links to Iceland's contribution to the **Millennium Development Goals** and to **Climate change, Desertification and Biodiversity** targets in the three relevant international Conventions to which it is a signatory.

How? Develop inspiring vision, clear objectives and testing targets and a comprehensive blend of incentives, market mechanisms and regulation to enable the strategy to be implemented effectively.

Who? The strategy should be developed through an open consultative process much like we have used in Scotland since the establishment of our Parliament a decade ago. It should be lead by government centrally and locally.

Outcome? Iceland as the laboratory and the best exemplar of real sustainable use of natural resources that yields good quality of life.

Ingredient 2: conserving the best of Iceland's environment

Why? There is a nature conservation plan for Iceland which is currently being implemented. But, the whole approach is piecemeal and some key components are missing. The size and number of the areas protected is inadequate given the quality of nature and landscape in an international context. There is no connectivity and linkage strategy to ensure that the areas protected are not isolated from each other to allow migration of species and proper functioning of ecosystems. The plan does not achieve the protection of key areas from exploitation, nor assess their sensitivity to the effects of development. Designation will enable the most environmentally critical areas to be safeguarded from harmful development forever and also place Iceland higher up the international league table for ecotourism in protected areas with the consequential benefits for local communities and for the nation as a whole.

What? The best natural resources should be conserved within protected areas framework using the best international practice as set out in the revised IUCN Management Categories published in 2008. The following should be the key components of this ingredient:

1. **World heritage suite**: at present Iceland has two World Heritage Sites – Surtsey and Þingvellir (the latter only for its cultural history). Iceland has taken a very limited view of its natural geological assets in terms of their world significance. A serial application should be prepared and submitted to the World Heritage Committee seeking inscription of all of the key features of the spreading zone, such as moberg and palaganite rocks, strato and shield volcanoes, and fissure eruption cones. This could then form part of a wider series, including sites already

inscribed, for example in the UK such as the Giant's Causeway and the St Kilda archipelago, representing the Outstanding Universal Value of the features associated with the opening of the north Atlantic Ocean

2. **Strict preservation of key areas of international natural heritage significance** to safeguard them forever from future exploitation. Given the potential energy resource in some areas and the objective of the master plans for power schemes to develop these natural sources, those rivers and geothermal areas that are of outstanding value for conservation, education, research, and public appreciation should be protected immediately from development. Two areas rate specific mention here, but there are many others that require similar treatment. It is notable that for many decades Þjorsarver has been the top of the list for protection and yet despite the calls from many Icelanders, amongst them Halldór Laxness the Nobel Laureate for Literature, and many in the international community, Iceland has failed to act formally to protect all of this outstanding area. Action to protect this area from the watershed of the Hofsjökull to the entrance to the Sultartangalon reservoir should be taken immediately the new government is in post. Equally important is the full protection of the whole of the course of the Jökulsá á Fjöllum because of its outstanding natural heritage value and to safeguard it in perpetuity from exploitation of water power for whatever use. Only parts of the river are protected in the Jökulsárgljúfur National Park. The current approach is quite inadequate to safeguard the last remaining large river in Iceland with its variety of features.

3. Consider the **establishment of national park for the whole of the highlands** which, from a natural heritage perspective is all special. This could be achieved through the completion of the designation of the Vatnajökull National Park by adding all existing protected areas and expanding the area to stretch from the continental shelf margin off the Skeiðárarsandur in the south to the whole of Öxarfjörður in the north. It will then be truly an internationally recognised asset. Good progress has been made, but more needs to be done to extend the benefits of national park status to the many communities particularly along the south coast, who seek to be included. In addition, the areas between Þjorsarver and the Vatnajökull National Park should be protected.

4. **Developing best practice in interpretation and education and encouragement of visitors**. There are a few good interpretation centres in Iceland but most are of poor quality, in the wrong place, are inadequately resourced, have the material in only Icelandic and frequently fail to get over the key messages to visitors. There seems to be an obsession with large buildings costing many millions of Icelandic kroner. The most recent example is the newly approved visitor centre at Skriðuklauster in Fljótsdalur, some kilometres up stream from Egilsstaðir. Its capital costs will be more than one year of operating budget of the Vatnajökull National Park, and it will have operating costs over and above that. To make matters worse another three are planned. This is the wrong approach – an

obsession with concrete taking no account of the role which local communities and local experts can play. A far more effective approach to interest and educate locals and visitors, and at vastly less cost, is to use existing facilities in key settlements. For the Vatnajökull National Park the obvious points are at Kirkjubæjarklaustur, Höfn, Egilsstaðir and Reykjahlið along with the existing, excellent centre at Skaftafell. In each of these settlements, local business should be funded to provide advertising and informative material in cafes, garages and shops, and locals employed as ambassadors of the park to be available throughout the tourist season to guide visitors, help them to have an informative time, stay longer in the area and spend more money. Local businesses should be encouraged by the nature conservation authorities and given incentives by the enterprise agencies to develop businesses in, for example, guiding and interpreting, and caring for the land and water resources.

5. **Engage local communities in the management of Iceland's special areas**. There is too strong a tendency for central control whereas international experience clearly shows that full engagement of local stakeholders in the decision making process and the delivery of action is beneficial. This is essential if the national parks and other protected areas are to work effectively. New governance models need to be adopted giving greater authority and responsibility to local stakeholders, including local municipalities, within an agreed national framework.

Ingredient 3: restoring the land

Why?

The land of Iceland has been degraded by human activity since The Settlement by removal of trees, and over grazing by sheep and horses. Its resilience has therefore been severely reduced to withstand natural events associated with volcanic activity, especially ash deposition and flooding. The Soil Conservation Service was established over a century ago to restore the land and conserve the soil. Despite its many successes, more needs to be done to change the ethic from exploitation to land care, to develop productive capacity for food and fibre, to build resilience against natural events and human over use, to demonstrate that land restoration is a major component of combating climate change, and to extend the natural laboratory on land restoration to benefit all of human kind.

What?

1. A carbon offsetting fund should be established with major industries and governments in the industrialised countries to support land restoration.
2. A new Protocol on Climate Change should be developed to present to all of the countries meeting at the climate summit in Copenhagen in 2009 to recognise the role of land restoration, soil conservation and vegetation recovery in greenhouse gas sequestration and climate change mitigation.
3. The 'Healing the Land' programme should continue with more resources to speed the pace of restoration using the assessment methods developed by Landgrædsla rikisins and the Agricultural University of Iceland.

4. The forestry programme should be amalgamated into the soil conservation programme as part of reform of the land restoration structure (see Ingredient 8 below).
5. There are conflicting levels and types of incentives between the forestry and soils programmes and these should be regularised and one regime applied.
6. More effort should be put into measuring progress scientifically on the sequestration of carbon and other GHGs as part of the link between Icelandic scientific interests and the Ohio State University, USA.
7. The lessons from the centenary of Icelandic soil conservation should be further disseminated as they are relevant to all other countries. The centenary book should be translated and published in English. The international Land Restoration training course run jointly with the UN University should be substantially increased and other opportunities taken through the UN agencies, especially the UN Development Programme, to develop Icelandic expertise to aid land restoration in developing countries, especially in Africa.

Ingredient 4: developing the intellectual base

Why?

Iceland has a well developed intellectual base and the nation prides itself on its ability to produce ideas and innovations. The University of Iceland and the many other smaller, but important, further and higher education institutions are a key ingredient of Iceland's future. Icelander's have a long tradition of gaining further expertise and knowledge by taking further qualifications in other countries. Joining with institutions in other countries can develop the intellectual base further and ensure that a major pool of intellect and innovation in the younger age groups stays in Iceland or at the very least returns after completing advanced studies.

What?

1. The fragmented structure of further and higher education should be reviewed to ensure that all of the communities throughout Iceland are well served by direct access and internet access (through high speed broadband) to learning opportunities.
2. The initiatives already underway between Icelandic scientific institutions and similar bodies elsewhere, such as Ohio State University and the UN University, should be further developed to allow cross fertilisation of ideas and sharing of scientific development.
3. Specific activities to aid the implementation of the new approach to natural resources are required including: whole life time analysis of key activities to inform debate and improve decision making; establishment of real economic values for natural resources using the valuation techniques of environmental economics; the development of improved indicators of land stability and resilience; the research, development and demonstration of further carbon and other GHG sequestration techniques, and increasing further the understanding of Iceland's natural history through scientific research.

Ingredient 5: skilling the future

Why?

The current economic circumstances of Iceland and the need to change the approach to natural resource use and management mean that Icelanders will need to develop new skills and those already in the jobs will need to be re-skilled. There are many new demands, such as the ability to translate innovative ideas into a practice, to know how to run a viable business, to negotiate solutions in different circumstances particularly in relation to conflict reduction, to develop the capacity of individuals in remoter locations and in smaller communities to undertake new roles, etc.

What?

1. The new natural resource strategy should identify the skills required for the future and ensure that the further and higher educational institutions are making the necessary provision. Those who manage the land and other natural resources, particularly farmers, should be the priority for re-skilling and extending their expertise.
2. Further development of a network of skills centres around the country should be undertaken to attract experts and attract young people from moving to the Reykjavik area. These centres should be sufficiently flexible to promote re-skilling and the retraining of those already in work. This will require a joint effort by further and higher education institutions.
3. Greater availability of high speed broadband to engage the whole of Iceland, especially remoter rural areas, will increase access to learning facilities and learning support.
4. A number of initiatives for spreading the knowledge about Iceland and the innovative learning experiences available should be encouraged. This can be achieved in two ways. International outreach centres should be established at key locations related to hot spots of intellectual excellence. Schools on routes served by Icelandair in North America and Europe should be targeted to encourage teachers to visit (e.g. 36 geography teachers from Scotland visiting for one week in August 2009 will result in over 10,000 Scottish school students learning about Iceland) and also teacher-led student visits.

Ingredient 6: Adding value to raw materials

Why?

At present, too many of Iceland's natural resources are under valued and are sold in unprocessed form into global markets. Fish is an obvious example. Export of sea fish has been the backbone of the Icelandic economy for many decades and yet it is sold in raw form with limited added value in the processing or making it of more interest to the consumer in different markets. Consumers, particularly in industrialised countries, seek new products and new eating experiences. By adding value in the processing through the technology available and through cultural additions to food, the income to Iceland and the benefits to its people will be increased. Also, there are increasing global concerns about the availability of food for the increasing population and for the changes in diet that are occurring. More production of food in Iceland for home consumption increases the nation's food security.

What?

1. The large food retailers in the industrialised countries have sophisticated ways of ascertaining consumer preference for different foods. This data should be used by the food processing industries in Iceland to identify opportunities for adding value to products. I note that consumers are becoming more interested in the traceability of food and on labelling systems which guarantee that food is produced in a sustainable manner, including organic food. This is a point that Icelandic food producers have not been exploiting
2. Key sectors of food production should be targeted to process raw food into finished meals. Sea fish should be the main target given the variety of recipes, and their culinary and dietary benefits. Icelanders have developed many ways of adding flavour to fish and meat through the smoking process. The sophisticated markets in the large cities of Europe are an obvious target. For example, a new approach to lamb export should also be developed given the quality of the raw meat and the many ways of adding flavour through smoking it.
3. Iceland produces substantial quantities of fruit, vegetables and flowers for its own consumption, using geothermal heat sources. A priority over the use of geothermal for electricity production for aluminium smelting should be the reduction of food imports by more efficient use of renewable heat and light to grow crops for local consumption in Iceland. This will not only lower import bills but increase food security.
4. Many countries in Western Europe are facing a crisis of energy, and especially electricity, supply. There are fears about over dependence on non-renewable sources because of their climate change implications and also lack of security of supply. The previously considered idea of electricity supply by cable from Iceland to Western Europe should be reconsidered. It is likely that, despite the high costs of the infrastructure, there is potentially a better deal for the national economy and therefore the people from this approach than under pricing electricity sales to aluminium companies. Very careful consideration will have to be given to minimise the environmental costs and maximise the public benefits before any decisions are taken.

Ingredient 7: changing behaviour towards natural resources

Why?

The Icelandic attitude to natural resources is that they are plentiful, renewable and so can be used with impunity without counting the longer-term costs. Electricity, heating and transport all seem to been used with this philosophy in mind. Also, the development of the Reykjavik conurbation seems to take little account of the environment footprint and the level of natural resources to maintain its infrastructure. International commentators and experts on energy when asked what the energy priority should be invariably identify energy savings and energy efficiency as the top priority. Certainly, this is what we found in Scotland in reviewing our energy position. At a time of financial crisis and the need to conserve resources rather than use them wastefully, changing attitudes and behaviours towards natural resources should surely be a key ingredient in the new Icelandic approach.

What?

1. In view of the national and personal financial benefits of reducing energy consumption from both non-renewable and renewable resources, a programme of energy savings and use reduction should be implemented. There is plenty of best practice experience in western European countries, especially in Germany and the Scandinavian countries.
2. Iceland was at the forefront of developing hydrogen as a fuel vector for transport using renewable energy sources. The programme seems to have lost momentum, but this is the type of innovative approach which the new Iceland should be pursuing with vigour with the support of the energy technologists and the financial support of the international energy research and development agencies. In the meantime, greater effort should be made in converting vehicles, particularly private cars, to using renewable sources of fuel, such as electricity. An incentive based approach for more environmentally benign fuels should be introduced alongside tax penalties for those vehicles with poor fuel consumption and using fossil fuels.
3. There seems to be little attention to reducing electricity and heat consumption in many households. Lower incomes and rising costs may well be sufficient of a stimulant. Beyond that, other options should be considered, such as taxing households on the basis of emissions and resources used rather than on the market value of the property.
4. In an increasingly urbanised country with an increasing proportion of the population having always lived in urban areas, there needs to be greater attention given to changing attitudes and behaviour to reducing waste, and increasing re-use and recycling. This will provide new energy resources, reduce the environmental footprint of communities, and save money. There are good examples already of communities using incinerators to heat swimming pools where there is limited natural geothermal power. A major rethink is required on the future of Reykjavik. The city is spreading out further and public transport systems are extremely poor. The energy consumption of the city is rising all of the time. As a result, its environmental footprint has increased considerably, especially in view of the reliance on private transport almost entirely fuelled from non-renewable energy with high greenhouse gas emissions. An energy and wider natural resource audit is urgently needed to demonstrate that lifestyles can be maintained and costs reduced by different approaches. And, a more strategic approach to the planning of the metropolitan area and a clear focus on reducing its environmental footprint is surely in the national interest.

Ingredient 8: improving administration

Why?

There is, by common consent, great fragmentation in the government administration in Iceland. This creates confusion and conflict between the different ministries and agencies so that less gets done. It also means that the costs of administration are higher than they need to be to provide the necessary services for the public. In the current economic climate, such inefficiency should be removed and the resources saved used for more

effective activities and the staff redeployed to more purposive activity with less time and money spent on overheads and administrative activity.

What?
As a former civil servant, it seems to me that more integrated approaches across the whole of government administration based on national strategic imperatives are needed. The new Cabinet needs to give leadership rather than leaving the matter to individual departments. There should be fewer central departments and far fewer agencies and committees. Mergers of similar interest bodies should be carried with the clear aims of reducing administrative costs and administrative burdens on individuals and businesses, on developing more customer orientated approaches rather than assuming that ministers and officials can impose their approaches everywhere. Government functions should be delivered in a more integrated manner throughout the country with government offices covering all functions in the same building to make access much easier to customers. And, there should be more delegation of responsibility and authority to local municipalities which are likely to be more knowledgeable about local needs and circumstances.

In the administration of environment and natural resources nationally under the Ministry for Environment there are 14 separate agencies, over 20 committees and over 20 statutory reporting mechanisms. This is a highly centralised and very fragmented approach. I welcome the action to review the position currently underway. The review should achieve the following outcomes: improved conservation of natural resources, natural resources management, and ecosystem services; increased administrative efficiency and effectiveness; greater contribution to Iceland's economy; and improved engagement of local constituents.

The solution for good governance and reduction in the use of scarce public resources should be to:

1) Merge agencies with similar remits, to give them multi skills, a new broader focus and a more integrated approach;
2) Establish integrated administration and advice centres in key locations around Iceland; and
3) Engage local community representatives in new governance structures.

In addition, it would be beneficial to have a Minister for the Environment and Natural Resources.

Nothing different here?
Many readers will say that there is nothing different in the above to what has been said many times. I am sure that this is correct. But, these points needed to be made at this time, and repeated, as many Icelanders have said to me. The points might have added strength made by a non-Icelander who is a friend of the country, and is familiar with the country, its people and the issues it faces.

Since preparing my talk and producing this written version, I have read Arni Snær Magnason's book *Dreamland: a self help manual for a frightened nation*. The fact that many of the same points are made by that author and many of the arguments have been heard before, seems to me to give added urgency to a national debate rather than continuing on the present course.

Remember that the current circumstances are different and the challenges greater than previously. Also remember the challenge of learning from past mistakes. Business as usual is not an option. The Icelandic people are naturally creative and able to survive in adversity. Make the care for, value and use of natural resources a reality. There is plenty of help available from your friends in other countries, but there is no model for you to copy. Indeed, a number of people asked me after my talk: where is the model from another country? There is none. I hope that Iceland is sufficiently creative and would wish to come up with its own solutions rather than repeat the mistakes of others. The current approach based on over exploitation and under valuing the nation's natural resources seems to be based on the model used by others.

Personally, I am optimistic because of Icelander's own attitudes and philosophy as expressed to me by many of the younger generation during my recent visit.

LET THE YOUNG FASHION THE FUTURE!

The debate about the future of Iceland's environment, and by implication its economy and social wellbeing, tends to be undertaken by the adult population. Yet those most affected are the young who will be the opinion formers and parents of the succeeding generations. I have found that engaging the young in debates, for example about the future of energy supply and use in Scotland, is refreshing and rewarding because of the different perspectives and thinking articulated. So I make a plea to the Prime Minister and to the President of Iceland now that the elections to the Althingi are over to engage the younger generation in the debate.

The Prime Minister and the President should jointly invite all school children throughout Iceland to develop their vision for the future when they are adults and the parents of the succeeding generation. Teachers should develop the process but not guide the children in their thoughts. To avoid a potential dislocation across the country, encouragement should be given to twinning between rural and urban schools so that the visions are shared and have a greater chance of becoming reality. This national futures debate should be supported by the web and by TV and radio so that the ideas are fully aired for the whole nation to listen to and engage in. A full debate lead by Iceland's young people should be staged in the Althingi and a new vision fashioned as the key outcome.

Only this way might Iceland get away from the unhelpful and futile polarisation that has dogged debates on the future use of its natural resources for many decades.

****Iceland should aspire to be the laboratory and the best exemplar of real sustainable development of natural resources in the world****

****At present, it is aspiring to be the aluminium production centre of the world based on under pricing and over exploitation of its natural energy resources****

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see www.rogercrofts.net for other articles and ideas on Iceland