A FRAMEWORK FOR SUSTAINABLE DEVELOPMENT IN IRELAND

Submission

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SUMMARY

In its current draft form, the *Framework for Sustainable Development in Ireland (FSDI)* makes no mention of the practice of hydraulic fracturing for the exploitation of shale gas reserves. This is an unthinkable omission. Hydraulic fracturing ("fracking") is potentially the single greatest obstacle to the attainment of the sustainable development objectives to which Ireland is committed and which are set forth in the *Framework*.

Two regions of Ireland – the Lough Allen region and the Clare basin—are currently covered by license options that enable gas companies to conduct desktop studies of shale gas reserves, with a view to future exploitation. These license options expire in February 2013, after which time the gas companies will be able to apply for exploration and ultimately exploitation licenses. At present, there is no statutory regulation of the shale gas industry in Ireland. However, the recent experience of this industry in the USA has shown that if it is allowed at all it must be strictly regulated.

Some examples of the minimum regulatory measures that would be required include the following:

- Regulations related to the design and construction of gas wells (especially with respect to capturing fugitive emissions from venting),

- Strict requirements on companies to disclose the chemicals used in each instance of fracking, including the quantities used,

- Requirements on the gas companies and public authorities to collect baseline data samples from underground and surface water in the vicinity of each well to be fracked, specifically testing for the chemicals used in fracking, as well as for the

heavy metals and radioactive substances that are released from underground by fracking,

- Strict controls of the sources of fresh water used as fracking fluid,
- Strict control of the storage and disposal of fracking flowback water, including the classification of this highly toxic and radioactive wastewater as hazardous waste, and the requirement for it to be disposed of accordingly,
- Heavy punitive fines for any breaches of the above and other environmental regulations,
- Full public consultation, including the requirement for an EIS and planning permission, for each well to be constructed.

Even with regulation, however, hydraulic fracturing is a highly polluting practice that wastes precious water resources, converts green countryside (agricultural land and forestry) into heavily contaminated industrial zones, emits greenhouse gases (in particular methane), perpetuates the "brown economy" by prolonging the dependence on fossil fuels, jeopardises the sustainable livelihoods of rural dwellers that depend on a clean environment (namely in agriculture and tourism), puts at risk the health of rural dwellers for short-term economic gain, against their will and without their consent, and creates an enormous burden on the state in terms of regulation, monitoring, and the disposal of hundreds of millions of gallons of hazardous wastewater.

Hydraulic fracturing is completely inconsistent with Ireland's sustainable development principles and objectives as set forth in the *FSDI*. If the *FSDI* is to be credible, comprehensive, and suitable for the period of time it is intended to cover, it must specifically and definitively address the issue of hydraulic fracking. The only way of addressing this issue that does not contradict the principles and objectives set forth in the *FSDI* is for it to be permanently banned throughout Ireland.

To demonstrate that the Irish government is committed to achieving the vision of sustainable development that is set forth in the *FSDI*, the Minister for the Environment, Community and Local Government, Phil Hogan, T.D. should initiate legislation to ban fracking permanently in Ireland, such legislation to precede or accompany the publication of the final version of the *Framework for Sustainable Development in Ireland*.

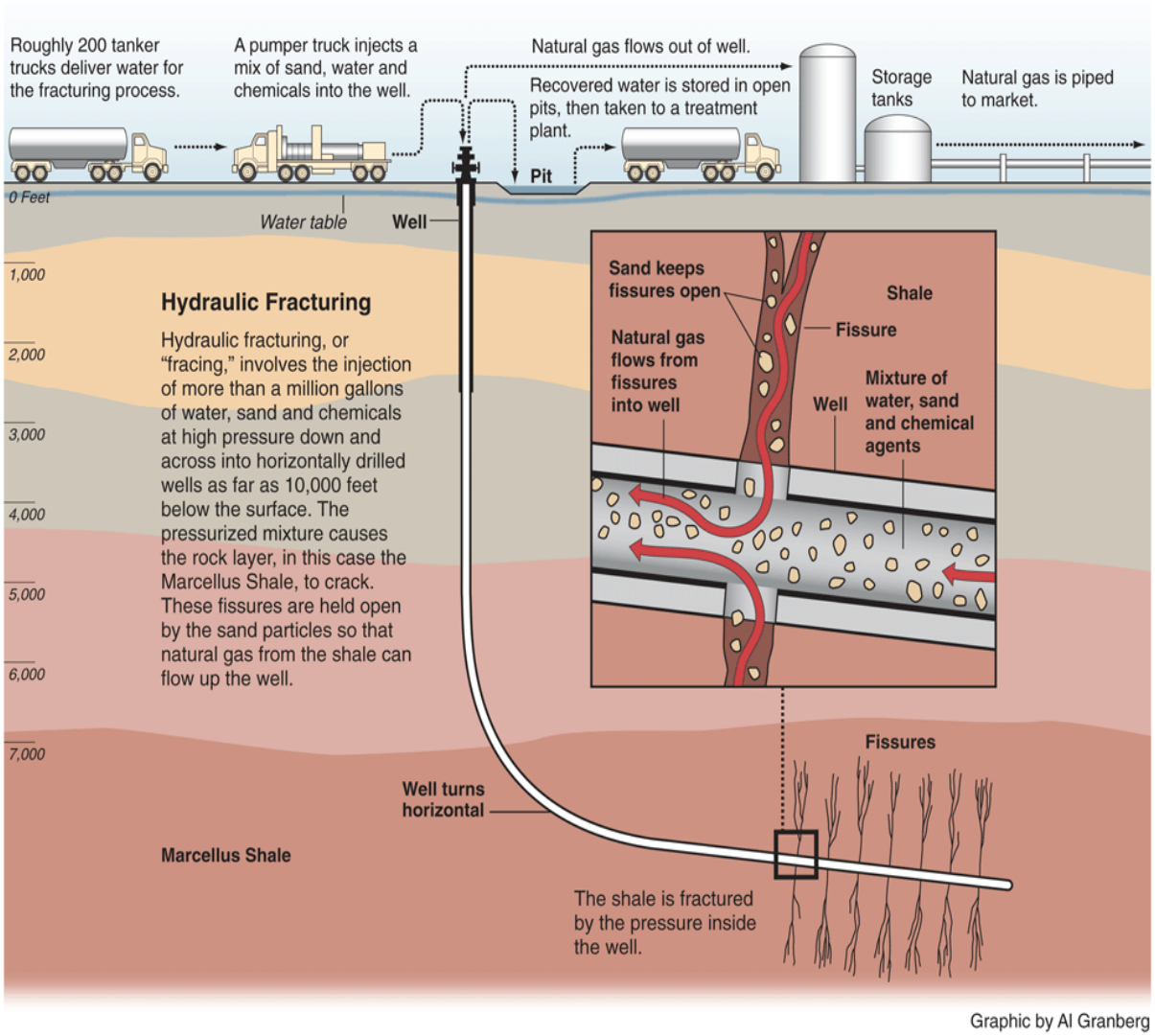
Hydraulic Fracturing – An Introduction

(Source: http://www.propublica.org/special/hydraulic-fracturing-national)

What Is Hydraulic Fracturing?

Hydraulic fracturing is a process used in nine out of 10 natural gas wells in the United States, where millions of gallons of water, sand and chemicals are pumped underground to break apart the rock and release the gas.

Scientists are worried that the chemicals used in fracturing may pose a threat either underground or when waste fluids are handled and sometimes spilled on the surface.



Environmental Problems Associated with Hydraulic Fracturing

Environmental problems associated with hydraulic fracturing include:

- Water source depletion
- Groundwater contamination
- Surface water contamination
- Air pollution
- Greenhouse gas emissions
- Destruction of green infrastructure
- Earthquakes

Water source depletion

At least one million gallons of fresh water is required to frack one well one time. Each well may be fracked up to 12 times. At a density as high as one well per 40 acres (16 wells per square mile), as is permitted in some parts of the USA, one square mile of fracked land could require as much as 192 million gallons of water. The total area covered by the license options that have been awarded in Ireland is 752.13 square miles (1,948 sq. km). This enormous quantity of fresh water is mixed with toxic chemicals and cannot be reused/recycled because doing so increases the concentrations in the water of radioactive substances and heavy metals that come up from the ground. Thus, fracking converts fresh water that could be used to meet Ireland's domestic and industrial needs into hazardous waste.

The following text related to the chemicals used in fracking is from *Wikipedia*:

> Chemical additives used in fracturing fluids typically make up less than 2% by weight of the total fluid. Over the life of a typical well, this may amount to 100,000 gallons of chemical additives. These additives (listed in a U.S. House of Representatives Report) include biocides, surfactants, viscosity-modifiers, and emulsifiers. They vary widely in toxicity: Many are used in household products such as cosmetics, lotions, soaps, detergents, furniture polishes, floor waxes, and paints, and some are used in food products. Although some of the chemicals pose no known health hazards, some are known carcinogens, some are toxic, some are neurotoxins. For example: benzene (causes cancer, bone marrow failure), lead (damages the nervous system and causes brain disorders), ethylene glycol (antifreeze, causes death), methanol (highly toxic), boric acid (kidney damage, death), 2-butoxyethanol (causes hemolysis).

> The 2011 US House of Representatives investigative report on the chemicals used in hydraulic fracturing shows that of the 750 compounds in hydraulic fracturing products "[m]ore than 650 of these products contained chemicals that are known or possible human carcinogens, regulated under the Safe Drinking Water Act, or listed as hazardous air pollutants".

Groundwater Contamination

Residents of many US states where fracking has been practiced have complained of dramatic changes to their well water – bad smells, black colour, cloudiness – and of detrimental effects on their health. In a number of cases, notably in Pavillion, Wyoming and Dimock, Pennsylvania, residents have been advised to no longer drink their well water. In December 2011, the US EPA published the results of its investigation into the water in wells near fracked gas wells in Pavillion and found chemicals known to be associated with fracking.

Another groundwater problem associated with fracking is methane migration. The methane gas released underground can migrate into aquifers, giving rise to the phenomenon of tap water that can be set fire to.

If fracking fluid injected into the ground poses a risk to groundwater, so does the storage and disposal of millions of gallons of toxic wastewater. This water is typically stored in open pits or condensate tanks, to allow the VOCs to evaporate out and reduce the toxicity of the wastewater. The evaporated VOCs, in addition to posing a health risk as air pollution, are returned to the environment as toxic rain, which ultimately affects groundwater.

Surface Water Contamination

If the toxic wastewater is spilled, leaked from pipes, or deliberately dumped into water bodies, surface water as well as groundwater can be contaminated. The *New York Times* has revealed how fracking wastewater that has been processed in sewage treatment plants that are not capable of treating radioactive material has been released, post-treatment, into rivers that are sources of drinking water. It has also revealed the high levels of toxic chemicals such as benzene and radioactive substances such as radium and uranium that have been found in samples from well and surface water throughout the state of Pennsylvania. Pennsylvania has since prohibited the disposal of toxic fracking wastewater in the state, and wastewater from Pennsylvania is now being pumped into

disused boreholes in the neighbouring state of Ohio, a practice which is causing earthquakes in that state (see below).

Air Pollution

From the Wikipedia Hydraulic Fracturing page:

> One group of emissions associated with natural gas development and production, are the emissions associated with combustion. These emissions include particulate matter, nitrogen oxides, sulfur oxide, carbon dioxide and carbon monoxide. Another group of emissions that are routinely vented into the atmosphere are those linked with natural gas itself, which is composed of methane, ethane, liquid condensate, and volatile organic compounds (VOCs). The VOCs that are especially impactful on health are benzene, toluene, ethyl benzene, and xylene (referred to as a group, called BTEX). Health effects of exposure to these chemicals include neurological problems, birth defects, and cancer.
>
> VOCs, including BTEX, mixed with nitrogen oxides from combustion and combined with sunlight can lead to ozone formation. Ozone has been shown to impact lung function, increase respiratory illness, and is particularly dangerous to lung development in children. In 2008, measured ambient concentrations in the rural Sublette County, Wyoming where ranching and natural gas are the main industries were frequently above the National Ambient Air Quality Standards (NAAQS) of 75ppb and have been recorded as high as 125 ppb.

Greenhouse Gas Emissions

Researchers from Cornell University (Robert Howarth et al.) published in April 2011 a study (*"Methane and the greenhouse-gas footprint of natural gas from shale formations"*) which demonstrated that the greenhouse gas footprint of shale gas is worse than oil and coal. While the CO2 emissions of natural gas are lower than those for oil or coal, the methane emissions from the extraction and combustion of shale gas are higher. In the short term, when it is crucial that global greenhouse gas emissions be cut, shale gas exploitation increases them significantly. This is a quote from the press release for an updated study by Prof. Howarth (Jan. 19, 2012):

> "We believe the preponderance of evidence indicates shale gas has a larger greenhouse gas footprint than conventional gas, considered over any time scale. The greenhouse gas footprint of shale gas also exceeds that of oil or coal when considered at decadal time scales, no matter how the gas is used. We stand by the conclusion of our 2011 research: 'The large [greenhouse gas] footprint of shale gas undercuts the logic of its use as a bridging fuel over coming decades, if the goal is to reduce global warming.'"

Destruction of Green Infrastructure

In all of the areas covered by the Irish licensing options, the local economy depends overwhelmingly on the green infrastructure, notably for agriculture and tourism. The construction of shale gas well pads densely situated throughout the countryside, along with the construction of the network of roads required to service each one by heavy tanker traffic, would turn these parts of rural Ireland into heavily industrialized zones. The effects of this industrialization on the ecosystem can only be imagined, and the permanent destruction of the green infrastructure that has supported Irish communities in these areas for thousands of years would be devastating in societal and cultural terms.

Earthquakes

As noted above, fracking is associated with earthquakes. Fracking-related activities have been blamed for 11 earthquakes that occurred in Youngstown, Ohio in 2011. The area is not normally seismically active. The largest and most recent of these earthquakes was on New Year's Eve, 2011, and was of magnitude 4.0. Similarly, earthquakes have been linked to fracking in Oklahoma, New York, and in Lancashire, England (Cuadrilla, the gas company performing fracking in the area, recognised in late 2011 that its activities had been the likely cause of two "seismic events" and temporarily suspended operations).

Hydraulic Fracturing Incompatible with Sustainable Development Principles

As the foregoing discussion makes clear, if hydraulic fracturing is allowed to be performed in Ireland, it will violate all of the sustainable development principles set forth in the *Framework for Sustainable Development for Ireland*. The following are a few specific examples.

1. *"Development which meets the needs of the present without compromising the ability of future generations to meet their own needs"* (p. 1 of draft *FSDI*)

   ➔ Needs of present and future generations that are at risk from fracking:

Clean water in sufficient volumes to meet domestic and business requirements.	Fracking would convert hundreds of millions of gallons of fresh water into toxic and radioactive wastewater, the disposal of which could put drinking water supplies at risk.
Clean air to breathe.	Gas well emissions are toxic, as are the VOCs that are allowed to evaporate into the atmosphere from wastewater pits.
A clean and safe environment in which to farm and receive tourists.	Gas well pads and access roads convert farmland into industrial zones with polluted water and air.
Reduction of greenhouse gas	Shale gas exploitation increases

emissions in the short term, to prevent catastrophic global climate change in the medium to long term.	methane emissions substantially, giving it a greater greenhouse footprint than oil or coal.
Clean, renewable energy.	Shale gas is a polluting fossil fuel in finite (and uncertain) supply. Temporary reliance on shale gas, prolonging the "brown economy" would delay Ireland's emergence as an exporter of renewable energy, giving other countries the economic edge while we polluted our own environment for generations to come.

2. *"Environmental policy priorities include reducing greenhouse gas emissions in a comprehensive and cost-effective way, further enhancing water services infrastructure and waste management, and strengthening nature protection. To meet these challenges, Ireland will need to: strengthen its environmental management efforts; further integrate environmental concerns into environmental decisions; and reinforce international co-operation on environmental issues."* (p. 2)

3. *"Fight against climate change and limit the environmental impacts of resource use"*

   (p.4)

4. *"Water scarcity, air and water pollution, climate change, resource depletion and irreversible biodiversity loss are problems that have to be tackled as a matter of priority."* (p.4)

5. *"...towards the green economy and away from the 'brown economy' model with its emphasis on fossil fuel energy...the measures outlined in this Framework for Sustainable Development for Ireland seek to reflect this policy priority."* (p. 5)

6. *"...a renewed commitment to the established principles of precaution and prevention, rectifying damage at source, and polluter pays."* (p.5)

   ➔ How can these principles be implemented, without a single statutory regulation specific to hydraulic fracturing?

7. *"...a coherent, joined-up approach to policy making on sustainable development."* (p.5)

➔ "Joined-up approach": The Department of the Environment, Community and Local Government pursues sustainable development while the Department of Communications, Energy and Natural Resources pursues shale gas development...?

8. *"A central plank of Ireland's economic recovery will centre on the development of a green economy that recognises:*
    - *The opportunities for investment and employment creation in emerging sectors such as renewable energy, energy efficiency, and waste and water management, and*
    - *That this sustainable approach to economic development complements the core strength of our economy in the use of natural resources in the agriculture, forestry, fisheries, tourism, and energy sectors."* (p. 9)

9. *"Prices should reflect the real costs to society of production and consumption activities and polluters should pay for the damage they cause to human health and the environment."*

10. *"Resources should be used within the capacity for regeneration."* (p. 10)

11. *"The quality of landscapes, the heritage of the man-made environment and historic and cultural resources should be maintained and improved."* (p.10)

12. *"Guarantee citizens' rights of access to information and public participation procedures. Ensure access to review mechanisms. Develop adequate consultation with stakeholders, including citizens, businesses and social partners, and participatory channels for all interested parties."* (p. 10)

13. *"Protecting and enhancing Ireland's Green Infrastructure which can be defined as a 'network of green spaces that help conserve natural ecosystems and provide benefit to human populations...'"* (p. 13)

Two Scenarios

1. ***FSDI* publication without a ban on hydraulic fracturing**

Let us imagine that the final *Framework for Sustainable Development for Ireland* is published by the Department of the Environment, Community and Local Government sometime in 2012 or 2013. Around the same time, gas companies will likely be applying for exploration licenses, which will presumably include permission to perform hydraulic fracturing. Citizens in the twelve Irish counties covered by the licensing options will be aware that:

1) There is no regulation of hydraulic fracturing at all in Irish law,
2) Hydraulic fracturing will pollute our water and air and will very likely make us ill (while the Department of the Environment controls our septic tanks...)
3) Vast volumes of fresh water will be converted to toxic wastewater (while the Department of the Environment encourages us to recycle our rainwater...)
4) The decision of the Irish government to proceed with allowing shale gas exploitation by means of hydraulic fracturing will have been taken despite the firmly stated and unanimous opposition of five county councils (to date),
5) As citizens we were never consulted before the licensing options were granted, and our efforts to find out more about regulation, monitoring, how to be included in planning environmental studies, etc., have been met largely with silence by the government and the EPA.

In this scenario, the publication of the final *Framework for Sustainable Development for Ireland* will likely be met with anger and derision in the counties of the west and northwest, where people are well aware of what hydraulic fracturing is and the dangers it poses.

2. ***FSDI* publication with a ban on hydraulic fracturing**

Now let us imagine that the final *Framework for Sustainable Development for Ireland* is accompanied or preceded by a national and permanent ban on hydraulic fracturing, initiated by the Minister for the Environment, Phil Hogan, T.D. on the grounds that fracking is completely inconsistent with Ireland's sustainable development policy.

In this case, people throughout Ireland will know that the minister and his department are an effective force for the promotion of sustainable development within the Irish government. Measures such as water charges and septic tank controls will be seen as part of a joined-up policy approach that protects us from severe environmental degradation and health problems and preserves our green land for future generations.

Moreover, seeing that our government has listened to what we have already said, formally, through our local elected representatives – namely, that we do not want fracking in any shape or form, ever – and has responded by enacting a permanent ban, we will believe that the government is sincere about valuing our input. This

demonstration will encourage us to participate actively and constructively in future policy-making processes.

In short, if the public is to support the government on sustainable development, accepting new charges and lifestyle changes, government policy must be consistent. It must also recognise where there most serious threats lie, and address those serious threats in credible and definitive terms. Only then will the Irish people be able to trust that the sustainable development policies of the government are meaningful and in our best interest.

Suggested Improvements to the *FSDI*

1. Include Resource Exploitation

Exploitation of Ireland's mineral and fossil fuel resources is not specifically covered by the *Draft Framework* and it should be. As the current debate over whether or not hydraulic fracturing should be allowed in Ireland illustrates, this is an area with significant potential for policy conflicts between government departments, as well as conflicts between local representative bodies and the national government. Presumably, one of the purposes of the *FSDI* is to improve the coherence of public policy in Ireland and to ensure that sustainable development principles apply in all areas of government policy. Neglecting to even mention the very contentious policy area of resource exploitation in the *FSDI* will not help to achieve these aims. It should be specifically addressed in such a way as to provide guidance for Ireland's future development of its natural resources.

Currently, the Department of Communications, Energy and Natural Resources seems to be the voice within the government for the exploitation of Ireland's mineral and fossil fuel resources for economic gain. Given Ireland's current financial situation, it is understandable that this perspective be represented within the government. However, the exploitation of finite, non-renewable resources, accompanied as it often is by environmental damage to other natural resources (such as water), is by definition a step backward in sustainable development terms. Therefore, any future exploitation such of resources in Ireland must be explicitly guided by sustainable development principles.

The *FSDI* should explicitly include the following principles, and should set timetables for the development of legislative instruments as required:

- The exploitation of mineral and fossil fuel resources is not, in principle, consistent with Ireland's sustainable development aims.

- As the world's supply of finite resources is depleted, the economic value of all such resources is increasing. Therefore, resources whose exploitation was not previously considered viable may offer the prospect of economic gains for the state in the short term. However, there are often significant economic risks associated with the exploitation of resources that are difficult to access in significant amounts. Therefore, extra care must be taken when deciding whether or not to exploit such resources. The potential economic gains must be set against the potential costs in terms of the environment, human health, Ireland's greenhouse gas footprint, sustainable livelihoods in areas such as agriculture and tourism, and Ireland's "green" image.

- Where finite, non-renewable natural resources such as mineral resources and fossil fuels are to be exploited, the following principles must apply:

    1. All revenue from these inherently unsustainable sources will be dedicated entirely to enhancing Ireland's sustainable development, so as to ensure that Ireland is in a stronger and more sustainable long-term position as a result of any short-term revenue gained from the exploitation of these finite resources. Using revenue from finite resources simply to finance current expenditure would leave Ireland financially vulnerable and in a weaker position overall when the resources are ultimately exhausted.

    2. A Strategic Environmental Assessment will be conducted as a matter of course.

    3. The government will not enter into any discussions with companies seeking to exploit Ireland's resources without first consulting the people in the areas likely to be affected about the potential benefits and costs, in environmental and economic terms. A thorough process of public consultation for such cases will be developed and implemented. This public consultation will include the following elements:

        a) Letters will be sent to every household in the affected areas, explaining the resource exploitation being considered by the government and inviting householders to informational meetings.

        b) The public consultation period will be ongoing, involving local residents at every stage of the decision-making process. The public consultation will begin with the initial letter to householders (before any negotiations with companies begin) and will continue through the entire process of performing environmental impact assessments and the decision to grant or not grant licenses.

        c) All public hearings and informational meetings will be thoroughly advertised on local radio and in the local press, to ensure the greatest possible public participation and democratic input into decision-making.

        d) All information relating to the public consultation and decision-making process will be published on the relevant government websites, including the specifications and outcomes of any studies commissioned by the government.

4. Local authority sustainable development plans and the views of local authorities with regard to resource exploitation in their localities will be given priority consideration.

5. No exploitation will be allowed in cases where the guaranteed revenue to the state could be insufficient to cover the worst-case scenario clean-up costs in the event of environmental accidents.

6. Where exploitation is allowed, the first revenue received will be used to create a fund sufficient to cover the worst-case scenario clean-up costs of environmental accidents, including potential compensation to those whose health and/or livelihoods are adversely affected by the exploitation. Until this fund is assured, the exploitation will be considered as a cost, not a as a source of income to the state.

7. Inherently polluting forms of resource exploitation, such as hydraulic fracturing, will not be allowed in Ireland and will be explicitly prohibited by appropriate legislation.

2. Other Suggestions

- The current public consultation system does not give one the impression that the central government is actually very interested in hearing citizens' views. For example, the public consultation period for the *FSDI,* a document which is presumably of interest to a great number of Irish people, was launched very discretely on December 23 (the day before Christmas Eve), in a single press release which did not give the deadline for submissions.

  I propose the following improvements (in addition to those specified above for the special case of proposed resource exploitation):

  1. The government should set up a single public consultation website, which would bring together the details of all currently open and upcoming public consultation processes across all government departments. This would make it possible for citizens who wished to have a say in decisions affecting them to find the information they required by periodically checking a single website, rather than relying on chance, as at present.

  2. This website should also include links to similar pages at local authority level.

  3. There should also be a facility on this website for citizens to sign up to receive email notifications and updates in areas of interest.

- I propose the following addition to the chart on p. 10 of the *Draft Framework for Sustainable Development for Ireland*, which sets forth *"Principles for Sustainable Development"*:

  For the theme *"Equity between countries and regions"*
  After the principle: *"Promote fundamental rights....,"* I propose the insertion of the following principle:

  "Guarantee that the basic rights of rural residents to clean water, clean air, and an environment in which they can pursue sustainable livelihoods are not sacrificed to national economic interests."