

# Arigna Fuels

Response to Consultation on the Development of new Solid Fuel  
Regulations for Ireland

March 2021

## Summary

This company welcomes the launch of this overdue consultation on Solid Fuel Regulation. It is disappointing that the media and some politicians have focused on a proposal to ban bituminous coal rather than the objective of improving air quality. The consultation comes at a time when atmospheric scientists and medics say that any emissions to air are damaging and need to be eliminated and that 1300 extra deaths a year are related to air pollution. However, it is also estimated that 2,800 deaths occur annually on an all-island basis due to cold weather and fuel poverty leading to inadequate heating. This consultation and subsequent government policy need to address both issues.

It is generally agreed that the coal ban in Dublin “solved” the air pollution problem in Dublin at the time, with bituminous coal being replaced by a range of “smokeless” fuels and a move to gas. Bans also contributed significantly to improved air quality in Cork and other major cities. Legitimate sales of bituminous coal nationally have fallen by 78% since 1991. However, over the last 6 or 7 years air quality has deteriorated significantly in most Irish towns-large and small- which cannot therefore be attributed to increased bituminous coal usage.

The introduction of Solid Fuel Carbon Tax in 2013 has fundamentally changed the operation of the solid fuel market. The intention of the tax was to send a price signal that would encourage consumers to move to other forms of energy. Instead of that it has driven consumers to cheaper, dirtier and, in ever increasing numbers, to untaxed black market solid fuel products.

Sod turf is subject to carbon tax, but it is not enforced, creating a market distortion which has resulted in a growing demand in urban areas for the dirtiest fossil fuel where traditionally turf would not have been sold. The media and most commentators ignore the fact that SEAI estimates that domestic usage of turf products exceeds that of all coal products and that sod turf usage is twice that of bituminous coal. (SEAI Energy Balance). Regulation of the sale of sod turf especially in urban areas is necessary but as the sale of Bord na Mona briquettes ramps down over the coming years the importation of turf products from overseas must also be curtailed if air quality is to be improved. To put it mildly, it is senseless to make bog workers in Ireland redundant to help achieve local environmental targets only for a similar and inferior product to be imported from overseas.

Demand for wood has increased beyond current supply capability in peak season resulting in increased supply of very wet wood which has the highest emissions and lowest efficiency of all solid fuel.

Solid Fuel Carbon tax in its present format is unworkable and discriminates against legitimate traders in the market. The Minister for Finance in reply to a recent Dail question answered.

*“...As I, and my predecessor, have pointed out before, the collection of solid fuel carbon tax is heavily reliant on the regulatory regime covering the marketing, sale, distribution and burning of solid fuels in the State. This regulatory regime imposes higher environmental standards on coal in the State than applies in Northern Ireland. The regime is operated by the Department of Communications, Climate Action and Environment and is enforced by local authorities...”*

As the local authorities have never been given the resources to enforce the regulations and do not see themselves as having any role in ensuring tax compliance this amounts to a Smugglers Charter which will become more attractive as Carbon Tax increases each year.

One of the key reasons offered for the total ban of bituminous coal is that there will be a reduced requirement for enforcement. However, the experience in the larger “smokeless” towns shows this is not the case with the explosion in the supply of non-compliant “smokeless” products which is much more difficult to police. Supply of these products will undoubtedly increase in the event of a full bituminous coal ban. In this companies view a reasonable level of compliance can only be achieved by farming out market surveillance and audits to an independent company or agency with significant sliding scale fixed penalty notices applying based on frequency and severity of breaches. The regulations need to be simplified with anomalies removed to facilitate this. Enforcement by local authorities has never worked nor can it be made work. It is not similar to waste enforcement where there is local buy in, and the problems are easy to identify if not stop. These regulations will be nationwide and need to be enforced on a nationwide basis with the Minister for the Environment responsible to the Dail for domestic air quality. The recent Town Hall events organised as part of this consultation were useful – however the lack of a panel member to discuss enforcement has reinforced the industry view that this process is about introducing some headline grabbing environmental initiatives without any thought being given, or resources provided, to ensure this results in air quality improvements.

The application of Carbon Tax needs to be redesigned -this time by the Department of Finance, to eliminate the trade distortion that exists with cross border trade having a competitive advantage over southern based suppliers. If this is not done air quality will continue to decline regardless of any new environmental measures introduced.

The individual consultation questions are dealt with in the following pages.

## Consultation Questions

### 1. Are you in favour of a national regulation on solid fuels, and if so, why?

As solid fuels contribute significantly to air emissions all solid fuels need to be regulated.

### 2. What solid fuels should be subject to regulation and why?

In our view all fuels should be subject to an appropriate level of regulation including convenience products such as fire logs etc. sold by supermarkets with sufficient information and certification provided on all products. This will allow the consumer to make an informed choice as to suitability of the product based on where they live.

### 3. What standards or specifications should/could be applied to each type of solid fuel?

This is a very difficult question which cannot be answered within the scope of this consultation and needs detailed technical input. This company recommends that a specialized technical committee be set up to draw up standards and specifications for each of the fuel types considering the enforceability of any standards agreed. This should be possible within a six months' timeframe.

### 4. What do you believe are the most appropriate, implementable and enforceable regulatory approaches for each type of solid fuel?

As a principal we believe all permitted solid fuels should be certified to an appropriate level. This could be as simple as suitable labelling for dry wood to full specifications for manufactured smokeless fuels with an updated list on a website listing all those fuels certified for use in the Republic.

All sellers of fuel should be licensed with the licence fee used to pay for market surveillance. License requirements would be based on the size of the distributor with any importer (large or small) being responsible for, and bearing full liability for, imported product whether from Northern Ireland or elsewhere.

### 5. How can a transition to less polluting fuels and more efficient heating systems be supported? (Building upon the measures already set out in the Climate Action Plan)

Consumers need to be convinced of the need to move to cleaner fuels and these fuels need to be affordable. Consideration needs to be given to reduced tax or other incentive on low smoke fuels especially if a political decision is taken not to restrict sod turf sales. This could be done by way of a credit to compliant low smoke fuel manufacturers to reduce the burden on the end user.

### 6. What do you think is an appropriate timeframe for the implementation of a national regulation of solid fuel?

The Irish Bioenergy Association have lobbied for a reduction in moisture on wood products (initially to a maximum 25%) to be introduced in September 2021. As a smokeless fuel manufacturer, we would need six months to prepare for any changes.

7. What timeframe should be applied to the inclusion of new solid fuels into legislation to allow for the necessary transition, including the phase out of existing stocks?

See answer above.

8. Should suppliers and retailers be given a transition period to use up existing stocks of solid fuels not meeting emission standards and, if so, how long?

Six to nine months should be sufficient. Revised packaging may take longer due to design and order lead in times.

9. Are there particular challenges in terms of the enforcement of regulations applying to solid fuel burning, and how might these be best addressed?

Experience has shown that it is extremely difficult to enforce regulations in relation to solid fuel. The effect of lack of enforcement is seen in the pollution levels in many towns especially over this Winter period. As stated previously enforceability needs to be considered when designing new regulations. Local authorities have not been given the resources to police the existing resources and indeed some authorities do not believe the regulations should be enforced due to the effect on those in fuel poverty. The EPA in their 2019 Activity Report confirm it is their role to *'Coordinate a network of public service organisations to support action against environmental crime'* and *'Prosecute those who flout environmental law'* This clearly has not worked. There has been discussion by the EPA and others of the need to introduce a regional approach (similar to the system for Waste enforcement) for a long time now, but this will not be effective in a market that operates on an all-island basis. This company believes that the only way to enforce regulations is by an independent agency purchasing samples on a nationwide basis and acting appropriately based on the results. The Swift 7 scheme has fallen into disrepute as is evidenced by the amount of illegal product carrying the Swift 7 logo.

10. Do you have any further proposals to reduce air pollution from residential heating?

This company has produced and sold at pilot scale level a product (Harvestflame) that is both renewable and low smoke. As it is made from agricultural residues it is completely sustainable. The smoke emissions are very low and are proved independently in the attached supporting document. Other companies are also working on similar products. The use of these products requires no capital investment by consumers and can provide a renewable and clean alternative to people who cannot afford to engage in retrofits as envisaged by government policy. At a minimum they can provide an environmentally acceptable bridge to the day when no solid fuel is burned in Ireland. However, the fiasco that has been the on again, off again coal ban introduction has severely damaged

confidence amongst developers and financiers to develop full scale plants given the level of overcapacity that has been created in the low smoke fuel market due to these delays.

In short early producers of these new generation fuels are going to need to be incentivised if they are going to secure the investment needed to scale up to the level necessary to move the market to clean renewable solid fuels.

One option may be to open the 'Just Transition' funding to such companies.

#### 11. What performance standards, certification methods or quality schemes should/could be used to reduce air pollution caused by burning solid fuels?

Please see answer at Number 3 above. For manufactured smokeless fuels consideration should be given to a certification scheme which requires a preauthorisation test and a detailed quality manual for each fuel supplied to the market.

#### 12 Would broadening the application of the 10-gram smoke per hour to all solid fuels be appropriate?

The present 10 gram per hour test is only applicable to coal-based products as it requires a minimum burning rate (heat emission rate) per hour. This cannot be achieved in the present standard testing unit with other fuels. As indicated in answer to question 3 the appropriate standards for each fuel needs to be established by a technical committee.

#### 13. Are there any additional or different emission standards which could be applied to the broader range of fuels?

Not currently and the EU have failed to agree a standard test to be used in all countries.

#### 14. Is it appropriate to use moisture content as a standard for the application of regulations to wood and, if so, at what limit should the moisture content be set?

The Irbea proposal to reduce moisture to 25% from September and to 20% from September 2022 would seem an appropriate trajectory.

#### 15. What limit should be set as a cut-off point for the sale of wet wood?

- Bags/nets only.
- Up to 2m3.
- All wet wood; or
- Other- please provide reasons or evidence to support your answer.

Initially Bags/Nets and big bags holding less than 2m3. This should be reviewed after two years to see if the desired emissions reductions are being achieved.

## Supporting Information

The following peer reviewed journal paper has just been published and is relevant to this consultation.

Journal: Energy + Fuels

Title: A study of emissions from domestic solid fuel stove combustion in Ireland.

Authors: Anna Trubetskaya, Chunshui Lin, Jurgita Ovadnevaite, Darius Ceburnis, Colin O'Dowd, James J. Leahy, Rory F.D. Monaghan, Robert Johnson, Peter Layden, William Smith

<http://dx.doi.org/10.1021/acs.energyfuels.0c04148>

A Synopsis of the study is given here.

The PM emission factor results from the study are presented in Figure 1. This is the averaged result from the mean values of hot filter, ACSM and AE33 for each fuel across the two stoves tested, indexed with wood logs at 100 for ease of comparison.

As can be clearly seen, wood logs are the largest source of PM in the study, followed by peat and bituminous coal. Ecobrite (a branded Hetas approved smokeless fuel) and torrefied olive stone briquettes (branded Harvest Flame) produce the least amount of PM emissions. When the Ecodesign stove is used, this reduces PM emissions further.

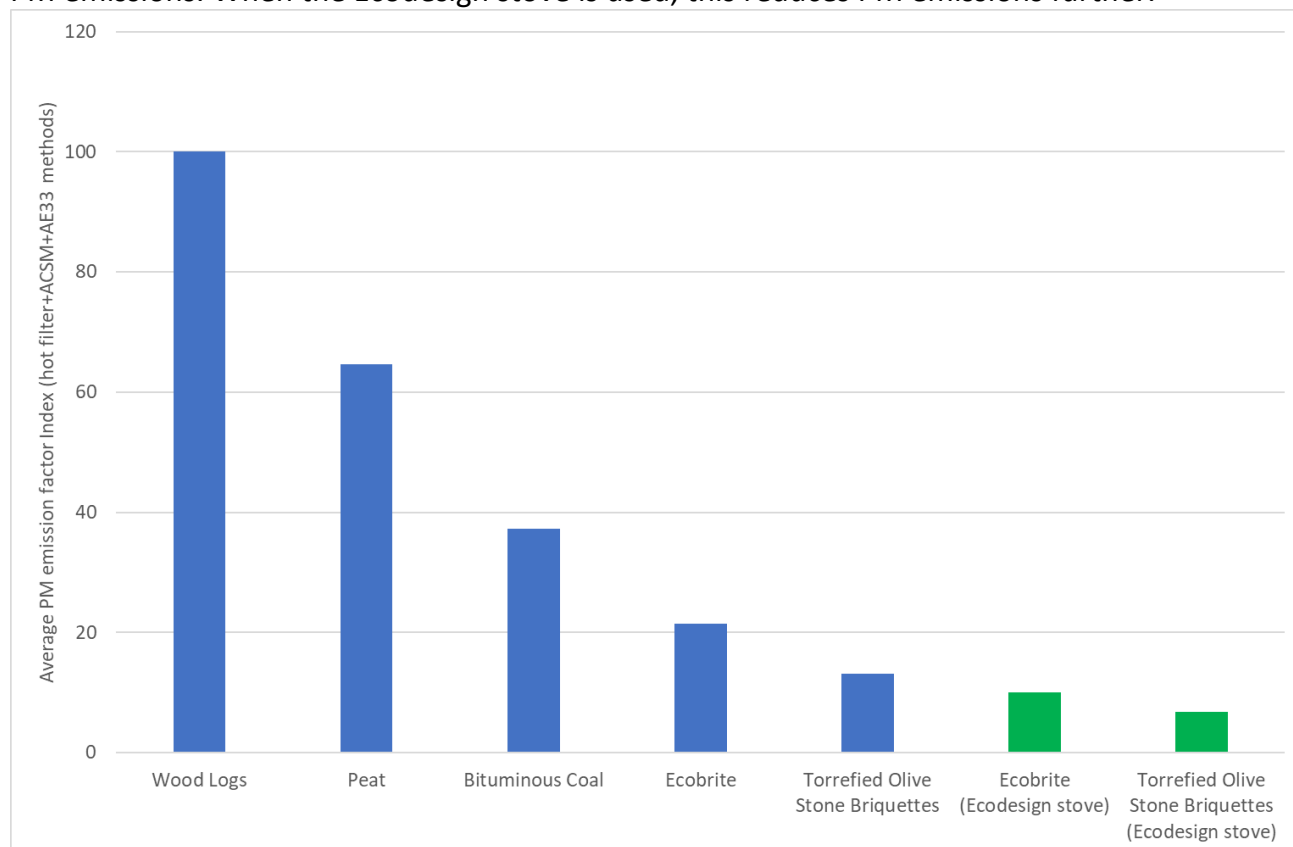


Figure 1- Average PM emission index with wood set to 100. Average of all hot filter, ASCM and AE33 results for the conventional and Ecodesign stoves.

This study also suggests that thermally pre-treating biomass using torrefaction can significantly reduce emissions compared to wood logs, peat, and smoky coal. A countrywide switch to 1) Eco-design approved stoves and 2) lower emitting solid fuels, could have a significant impact on air pollution reduction in Ireland. However, individual users will continue to exert a substantial, uncontrollable influence on the absolute level of PM emission from manually controlled domestic stoves.

A comparison of actual results from the study (average PM emissions g/GJ) and the relative index is presented in table 1.

Table 1 - Comparison of average actual PM emissions for each of the fuels burned and the relative index with wood = 100

	Index Average PM	Average PM emissions (g/GJ)
Wood Logs	100.0	49.7
Peat	64.6	32.1
Bituminous Coal	37.2	18.5
Ecobrite	21.4	10.6
Torrefied Olive Stone Briquettes	13.2	6.5
Ecobrite (Ecodesign stove)	10.1	5.0
Torrefied Olive Stone Briquettes (Ecodesign stove)	6.7	3.3

The objectives of this study are (1) to compare the particulate matter emission factors obtained from measurements using the hot filter method with those obtained using an Aerosol Chemical Speciation Monitor, and (2) to investigate the impact on stove thermal efficiency of burning a range of different biomass, fossil-based or pre-treated fuels. Wood logs, torrefied olive stones (TOS) briquettes, smoky coal, smokeless coal briquettes and peat were tested for comparison in two domestic multifuel stoves of different design.

Emissions from 5 solid fuels are quantified using a "conventional" and an Eco-design stove. PM measurements are obtained using both "hot filter" sampling of the raw flue gas, and sampling of cooled, diluted flue gas using an Aerosol Chemical Speciation Monitor and AE33 aethalometer. PM emissions factors (EF) derived from diluted flue gas incorporate light condensable organic compounds; hence they are generally higher than those obtained with "hot filter" sampling, which do not. Overall, the PM EFs ranged from 0.2 to 108.2 g GJ<sup>-1</sup> for solid fuels.



The PM EF determined for a solid fuel depends strongly on the measurement method employed and on user behaviour, and less strongly on secondary air supply and stove type.

Kerosene-based firelighters were found to make a disproportionately high contribution to PM emissions.

Organic aerosol dominated PM composition for all fuels, constituting 50-65% of PM from bituminous and low smoke ovoids, and 85-95% from TOS briquettes, sod peat, and wood logs.

Torrefied biomass and Ecobrite were found to yield the lowest PM emissions. Substituting these fuels for smoky coal, peat and wood could reduce PM<sub>2.5</sub> emissions by approximately 63%.

This study showed that wood logs generated the most amount of PM and CO<sub>2</sub> emissions, whereas TOS briquettes and Ecobrite produced less PM emissions than other solid fuels.

Burning of these products account for over 93% of the total residential particulate PM<sub>2.5</sub> emissions for the whole of Ireland. If, as proposed, domestic combustion of smoky coal and peat was 100% substituted with unprocessed biomass fuels, our results suggest that this could lead to significant increases in particulate air pollution.

Introduction of the Eco-design directive for solid fuel heaters in 2022 should assist with reducing PM, NO<sub>x</sub> and CO emissions over several years, however, significant emissions reduction could be achieved sooner if consumers were encouraged to switch to less polluting solid fuels.

The novelty of the present work derives from the use of dual measurement methods to determine PM emission factors from domestic stoves. These emission factors depend on user behaviour, on stove-specific features, and on the type of measurement method used.

Organic aerosols were the dominant constituent of PM emissions observed in our tests, regardless of the compositional differences between the fuels. However, black carbon constituted up to 90% of PM emitted by firelighters, and firelighters also displayed a PM emission factor far higher than any of the fuels studied. These findings will be explored further in a forthcoming paper.

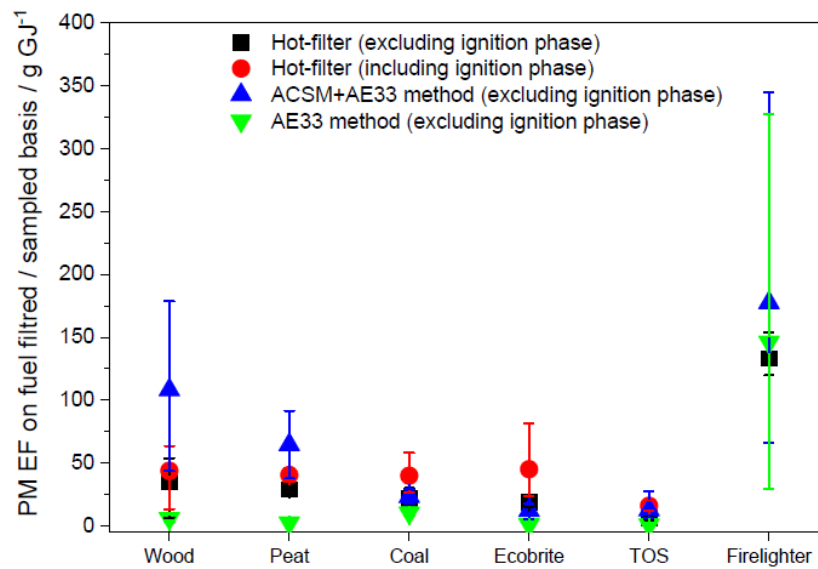


Figure 5: PM emission factors measured using gravimetrically using the hot-filter system including and excluding ignition phase, ACSM+AE33 and only AE33 excluding ignition phase from combustion of wood logs, torrefied olive stones briquettes, peat, Ecobrite briquettes, smoky coal and firelighter in conventional stove with primary air supply shown in  $\text{g GJ}^{-1}$ .