

European biofuel industry survey regarding the RED II proposal Full results

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Bioenergy

illuminating the markets

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Contents

Table of Contents

Executive Summary	5
Section 1: Introduction to the survey	7
Chapter 1.1: Background to the survey	7
Chapter 1.2: Review of the questionnaire	7
Chapter 1.3: Definitions	7
Section 2: Question responses	8
Chapter 2.1: Summary of responses and respondents	8
Chapter 2.2: Analysis of responses	9
2.2.1. General questions	9
2.2.2. Questions specific to the RED II proposal	13
Chapter 2.3: Discussion of results	25

List of Figures

Figure 1 Summary of survey responses	8
Figure 2 A1.1: Which of the following sectors does your business operate in?	8
Figure 3 A1.2: Do you see renewable energy as a field of future investment? If so, which of the following are you interested in?	9
Figure 4 A1.3: Do you already invest in bioenergy? If so, have you invested in any of the following?	10
Figure 5 A1.4: Do you see bioenergy as an interesting field of future investment? If so, which of the following are you interested in?	11
Figure 6 A1.5: Do you see Power-to-Gas (PtG) or Power-to-Liquid (PtL) as an interesting investment?	11
Figure 7 A1.6: Which of the following facilities are you currently involved with or have been involved with in the past?	12
Figure 8 Feedstocks in use at current and planned biofuel facilities	13
Figure 9 A2.1: Do you think the proposed targets for renewable fuels in the RED II proposal provide sufficient incentive to justify investment?	14
Figure 10 A2.2: If yes, which of the following advanced renewable fuels are sufficiently incentivised to attract investment?	15
Figure 11 A2.3: How do you think the reduction in support for conventional biofuels will affect investor confidence in advanced renewable fuels?	15
Figure 12 A2.5: Do you plan to invest in advanced renewable fuels if the RED II proposal is transposed in to law?	17
Figure 13 A2.6: If no, what are the barriers preventing your company from investing in advanced renewable fuels, assuming a binding target for them is introduced?	18
Figure 14 A2.9: How significantly would the RED II proposal need to be changed in order to incentivise the necessary investment in biofuels to meet the advanced biofuels target?	22

Executive Summary

Argus Consulting Services was commissioned by the Verband der Deutschen Biokraftstoffindustrie (VDB) to conduct a survey of the biofuel industry in relation to the RED II proposal. The goal of the survey was to understand industry views on whether there would be sufficient investment to meet the advanced biofuels target in the RED II proposal, and whether the reduction in support for first generation biofuels will affect investor confidence in advanced biofuels.

In total 26 respondents were surveyed from across the biofuel and associated sectors. The majority of companies surveyed were biofuel producers, but there were also a number of suppliers to the industry from the agricultural, chemical and forestry sectors.

According to the impact assessment for the RED II proposal, the European Commission estimates that €900mn/yr of investment in bio-refineries producing advanced renewable fuels would be required in order to meet the targets set in the proposed legislation¹.

The main findings of the survey were:

- All of the respondents believed the proposal needed to change in order to sufficiently incentivise investment in the sector to meet the advanced biofuel target.
- 65pc of survey participants surveyed did not believe the proposal would incentivise sufficient investment in biofuels production.
- 81pc of survey participants believe that the reduction in support for conventional biofuels will cause a reduction in investor confidence.
- 54pc of respondents stated they are not planning to invest in biofuels, assuming the REDII proposal is transposed into law. 46pc are searching for opportunity but no respondents have funds committed.

Many respondents, in addition to searching for opportunities to invest, stated they still see biofuels as an interesting field of future investment. This suggests a more positive industry outlook than was implied by the views that there will be insufficient investment in advanced biofuel production and that investor confidence is expected to fall as a result of the reduction in support for conventional biofuels.

The apparently conflicting themes of low predicted investment but positive outlook can potentially be explained by examining respondent's motivations for entering the biofuel market and the reasons they are searching for opportunities to invest.

Those mainly driven by the legislation were typically more critical of the RED II proposal and therefore less likely to invest in future. Those stating business or environmental drivers as their main motivations were less reliant on legislative support, instead quoting synergies with other parts of the business or national and European carbon

¹ Commission Staff Working Document: Impact Assessment: Accompanying the document: Proposal for a Directive of the European Parliament and of the Council on the promotion of the use of energy from renewable sources (recast)

targets, such as the EU's targets for 2030 and COP21, as the drivers behind their interest in biofuel developments.

Several respondents that were searching for investment opportunity stated they were not encouraged by the proposal but were looking for options to protect or make use of their conventional biofuel assets when the legislation changed.

Of the suggested changes, most related to increasing the timeframe of legislation, increasing ambition and reducing regulatory risk.

Section 1: Introduction to the survey

Chapter 1.1: Background to the survey

The goal of the survey was to answer two main questions in the context of the EU Commission's proposal for the Renewable Energy Directive II (RED II):

- Will there be sufficient investment in advanced renewable fuels to meet the targets set by the proposal for the RED II?
- Will the reduction in support for conventional biofuels, or other legislative uncertainty, affect investor trust for advanced biofuels?

The survey was predominantly conducted as a telephone interview using the questionnaire as a guide. An option to provide a written response was also offered for those unavailable for an interview.

Chapter 1.2: Review of the questionnaire

The questionnaire was made up of both open questions inviting views, and multiple choice questions to provide quantitative data for comparison of respondents. It was divided into two parts; the first contained questions focused on the respondents business and their attitude to investment in renewable energy, and the second focused on the RED II proposal itself and its effect on investment in the biofuel sector. The questionnaire has been provided in the appendix.

Chapter 1.3: Definitions

The definition of biofuels varies considerably both in the categories used and the specific biofuels included in each category. One of the major differences is the categorisation of waste-based biofuels which, in the case of the feedstocks in Annex IX Part B (UCO and tallow), typically use conventional production techniques, but are not reliant on the edible portion of crops as feedstock.

The European Commission have chosen, as part of the RED II proposal, to reduce the cap on crop-based biofuels and only create a specific target for alternative renewable fuels, which includes advanced biofuels and waste-based biofuels. Waste-based biofuels are capped and do not have a specific sub-mandate, however they will count towards the overall blending mandate.

To simplify the definitions, Argus has used the following:

- Conventional biofuels: Defined as crop-based, or first generation biofuels
- Advanced biofuels: Defined as all non-crop biofuels, including waste-based biofuels, such as UCOME

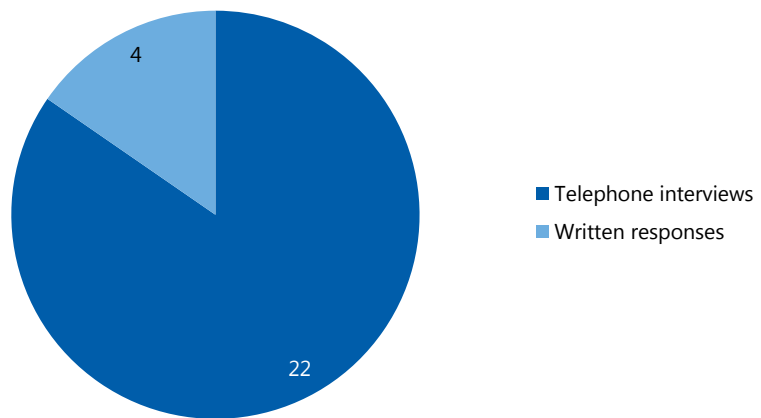
These categories follow the broad definition set out by the EC, where conventional biofuels are capped, and advanced and waste-based biofuels are included in the total renewable fuel mandate.

Section 2: Question responses

Chapter 2.1: Summary of responses and respondents

A total of 26 responses to the questionnaire were collected over a period of seven weeks. Of these, 22 were collected as telephone interviews and four collected as written responses. Telephone interviews were typically around 30 minutes in length but varied significantly between respondents.

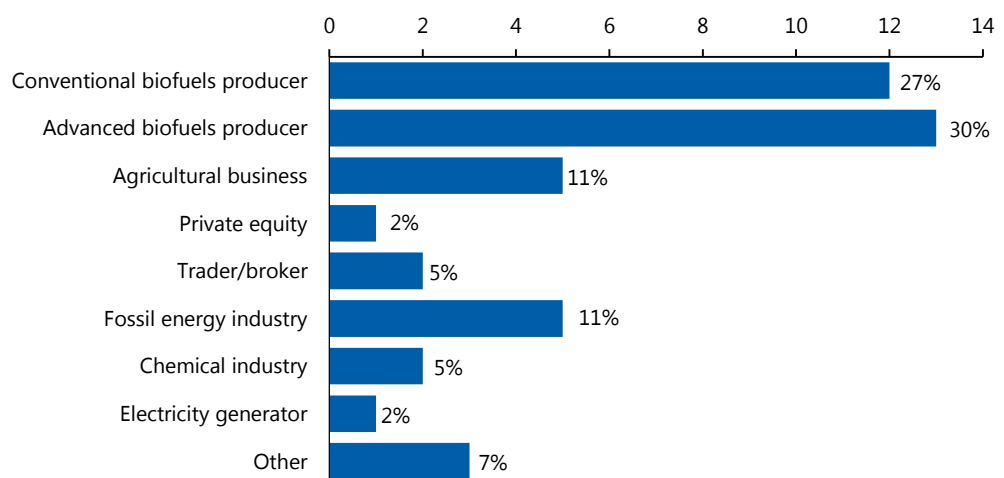
Figure 1 Summary of survey responses



2.1.1.1. A1.1: Which of the following sectors does your business operate in?

Survey responses were collected from a cross-section of the biofuel industry. Many respondents represented companies with interests across a number of sectors, but the majority were involved in biofuel production. Suppliers to biofuel producers were also well represented, with responses from agricultural businesses, chemical and forestry companies.

Figure 2 A1.1: Which of the following sectors does your business operate in?



Notes:

Multiple responses were given by some respondents

Other category made up of Supplier to grain ethanol producers, Steel industry, Pulp & paper and Biogas production

Chapter 2.2: Analysis of responses

The following section provides the analysis of the responses to the questionnaire, collected via both telephone interviews and written responses. It is divided into two sections. The first covers the general questions concerning the respondents attitude to investment in renewable energy and their current activities in the sector. The second section covers the respondent's views of the RED II proposal and its effect on investor confidence in the sector.

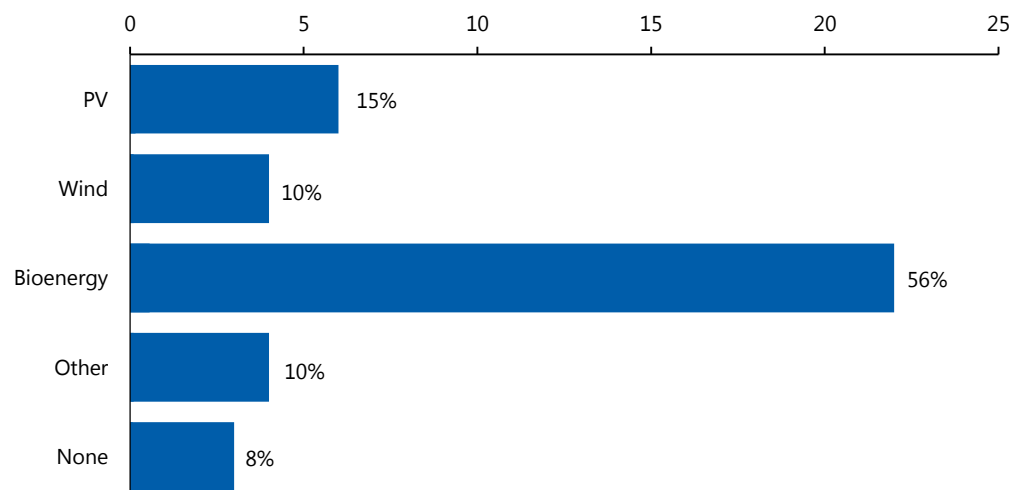
2.2.1. General questions

This first section of the questionnaire was designed to evaluate the respondent's current attitudes to investing in renewable energy, their previous investments in the biofuels sector, and their outlook for investment.

2.2.1.1. A1.2 Do you see renewable energy as a field of future investment? If so, which of the following are you interested in?

The majority of respondents see renewable energy as an interesting investment option, with 88pc responding positively and only three respondents saying they were not interested in investing in renewable energy. Bioenergy was the most popular option, followed by photovoltaics and wind. Most of those selecting PV and wind options indicated it was for use as onsite generation linked to other projects, rather than commercial-scale generation facilities.

Figure 3 A1.2: Do you see renewable energy as a field of future investment? If so, which of the following are you interested in?



Notes:

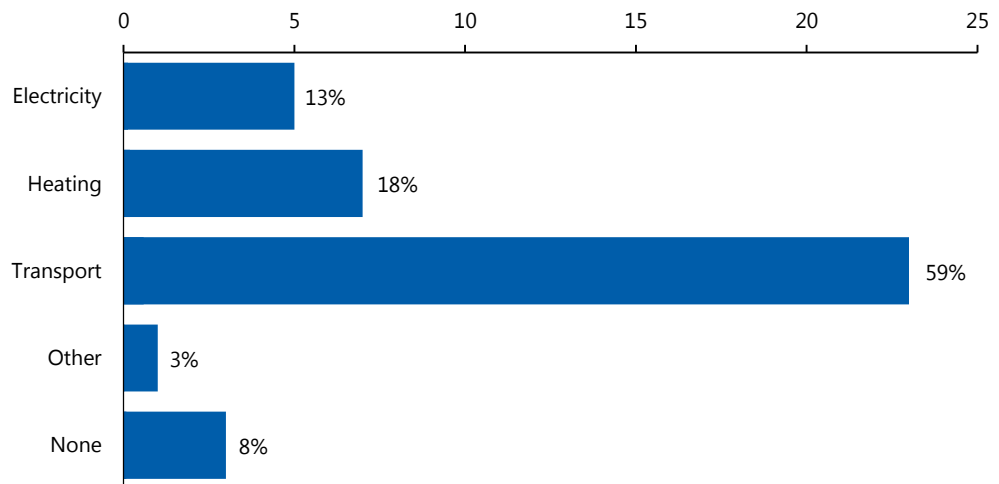
Multiple responses were given by some respondents

Other category made up of biochemicals, geothermal and waste-based fossil fuels

2.2.1.2. A1.3: Do you already invest in bioenergy? If so, have you invested in any of the following?

88pc of respondents indicated they have previously invested in bioenergy, all of which selected transport as the sector. In addition, some respondents also indicated they have previously invested in the bioenergy generation and heating sectors.

Figure 4 A1.3: Do you already invest in bioenergy? If so, have you invested in any of the following?

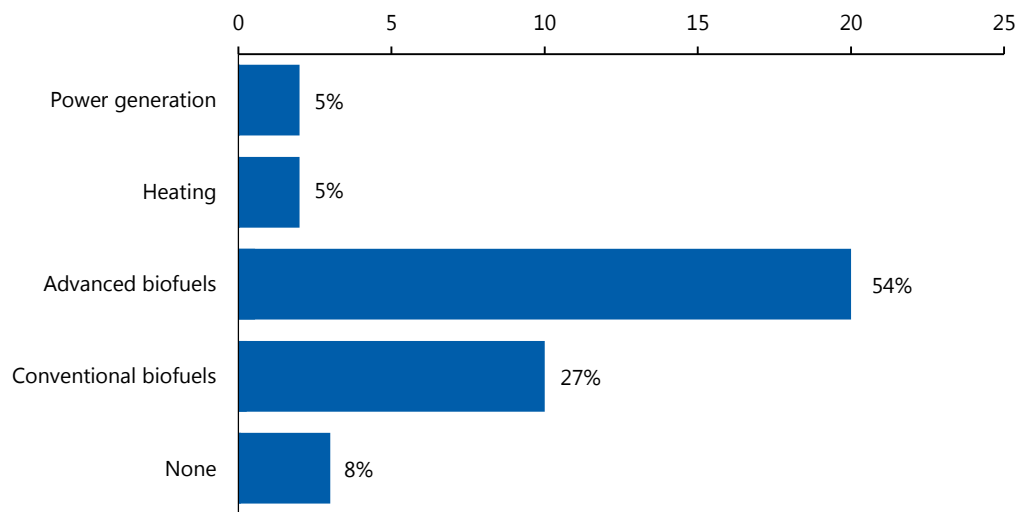


Notes:
 Multiple responses were given by some respondents
 Other category made up of biochemicals

2.2.1.3. A1.4 Do you see bioenergy as an interesting field of future investment? If so, which of the following are you interested in?

Of those indicating bioenergy to be of interest, very few selected power generation or heating sectors, with the majority selecting biofuel production. Understandably the focus is on the advanced biofuel sector, however there is still significant interest in conventional biofuels production, despite the policy support shifting away from crop-based biofuels.

Figure 5 A1.4: Do you see bioenergy as an interesting field of future investment? If so, which of the following are you interested in?



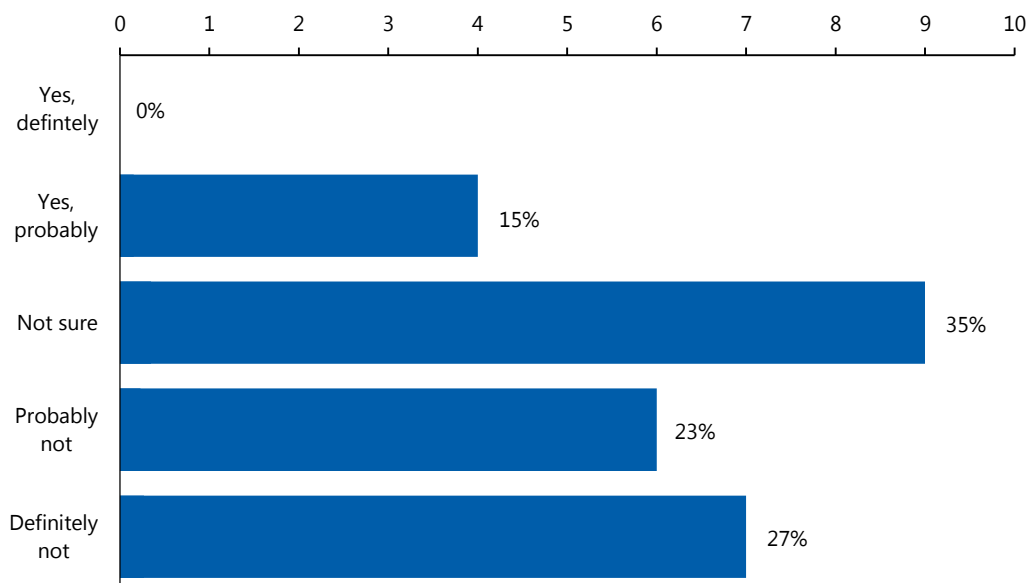
Notes: Multiple responses were given by some respondents

One respondent highlighted that, although advanced biofuels were of interest, the technology was not sufficiently developed to warrant investment.

2.2.1.4. A1.5 Do you see Power-to-Gas (PtG) or Power-to-Liquid (PtL) as an interesting investment?

Power-to-gas (PtG) and Power-to-Liquid (PtL) technologies are relatively niche and many respondents indicated they did not have sufficient knowledge to comment appropriately, hence "not sure" was the most popular response. 13 respondents indicated these technologies were not of interest and only four respondents indicated they were of interest.

Figure 6 A1.5: Do you see Power-to-Gas (PtG) or Power-to-Liquid (PtL) as an interesting investment?

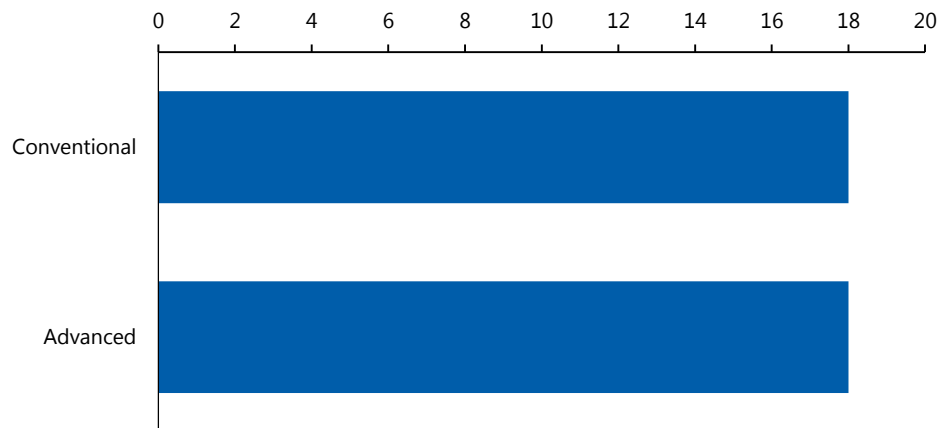


Respondent’s attitude to investing in PtG and PtL differed slightly between the two technology groups. One respondent highlighted PtL as being interesting but was not as interested in PtG. Similarly, another respondent stated they were already investing in PtL further up the value chain while another indicated they were only interested in PtL over the long term.

2.2.1.5. A1.6 Which of the following facilities are you currently involved with or have been involved with in the past?

Respondents were asked whether they had any involvement in either conventional or advanced biofuels facilities. The majority were directly involved as owner/operators but a number were linked to facilities as minority partners or suppliers. The number of responses for each facility type was equal at 18. Some facilities were able to accept both conventional and advanced feedstocks so would be counted under both categories.

Figure 7 A1.6: Which of the following facilities are you currently involved with or have been involved with in the past?



Notes: Multiple responses were given by some respondents

As part of question A1.6, respondents were asked to provide more details on the feedstocks used in the facilities they were currently, or previously, involved with. The figure below lists the feedstocks quoted by the respondent’s.

The feedstocks categorised as advanced were more varied than those listed as conventional. Waste-based biofuels, which were included in the advanced category, were the most common with UCO, Tallow and waste acid oils listed most frequently. This is to be expected given their popularity as a double-counted biofuel feedstock under current regulations. A variety of feedstocks that would be classified under Annex IX Part A of the proposal were also listed, but these included those that were linked to future facilities, or pilot scale production.

Figure 8 Feedstocks in use at current and planned biofuel facilities

Conventional feedstocks	Advanced feedstocks
Vegetable oils, inc:	Used cooking oil
- Rapeseed oil	Waste oils
- Soybean oil	Tallow
- Palm oil	Glycerine
Corn	Municipal solid waste
Grain	Agricultural residue
	Carbon monoxide
	Lignocellulosic material
	Crude tall oil
	Biowaste
	Slurry

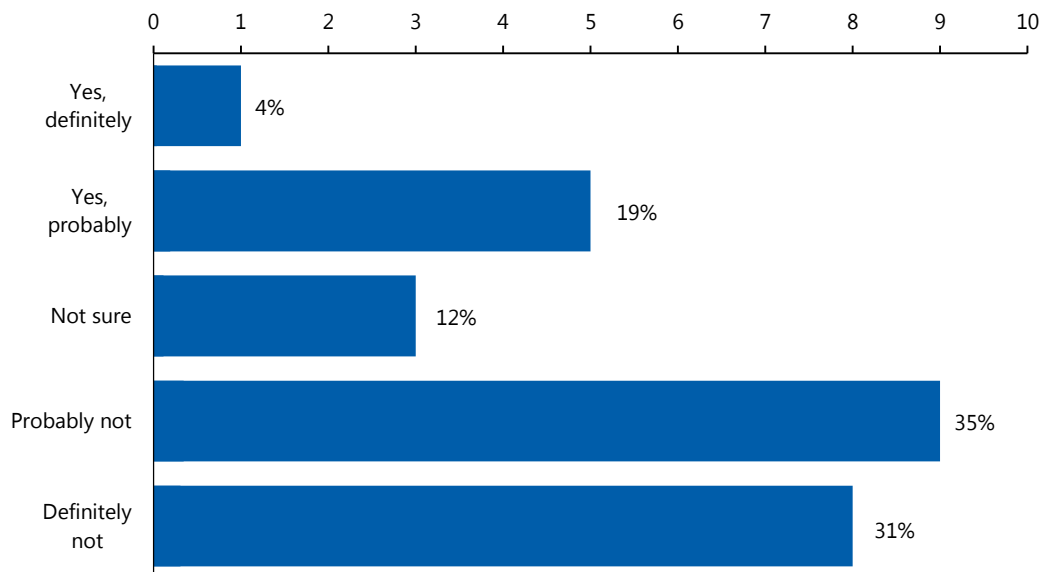
2.2.2. Questions specific to the RED II proposal

This second section of the questionnaire aimed to understand the respondent's views on the RED II proposal and its effect on investor confidence in the sector. The questions look to establish whether respondents believe there will be sufficient investment to meet the renewable fuel targets and what changes could be made to increase investment in the sector.

2.2.2.1. A2.1: Do you think the proposed targets for renewable fuels in the RED II proposal provide sufficient incentive to justify investment?

65pc of respondents believe the proposed targets in the RED II do not provide sufficient incentive to justify investment in the industry, as opposed to 23pc who believe that they do provide sufficient incentive. The remaining 12pc were not sure. Of those that thought there was sufficient incentive, one questioned whether the penalties would be severe enough to enforce the targets.

Figure 9 A2.1: Do you think the proposed targets for renewable fuels in the RED II proposal provide sufficient incentive to justify investment?



2.2.2.2. A2.2: If yes, which of the following advanced renewable fuels are sufficiently incentivised to attract investment?

Of those indicating the proposal does provide sufficient incentive to invest, the majority indicated this only applied to feedstocks in Annex IX Part A². The feedstocks in Part B³ and Other renewable fuels⁴ categories were each selected twice as being sufficiently incentivised.

Due to the technical knowledge required to effectively judge the merits of each category, some respondents were only comfortable voting for the category they were familiar with.

The different requirements for producing biofuels from the feedstocks in each category were discussed by one respondent. Part A feedstocks were deemed to require complex technology and significant CAPEX. While biofuels produced from Part B feedstocks and for the 'other renewable and gaseous fuels' category were deemed to use more conventional technology, and were therefore lower risk investments, with lower capital requirements.

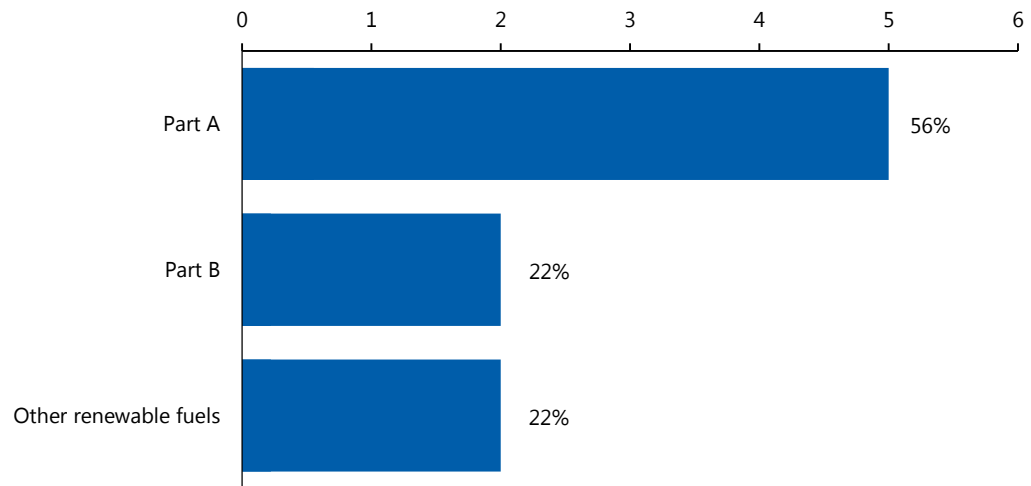
One respondent believed that there was already sufficient production capacity to meet the Part B mandate, and therefore new investment would be limited.

² Annex IX Part A includes the following feedstocks: straw, biowaste, manure, sewage sludge, POME & EFB, tall oil pitch, crude glycerine, bagasse, grape marcs, husks, nut shells, corn cobs, non-food cellulosic material, forest residues

³ Annex IX Part B includes the following feedstocks: used cooking oil, tallow, molasses

⁴ Other liquid and gaseous fuels includes the following: PtL / PtG, renewable electricity & waste-based fossil fuels

Figure 10 A2.2: If yes, which of the following advanced renewable fuels are sufficiently incentivised to attract investment?

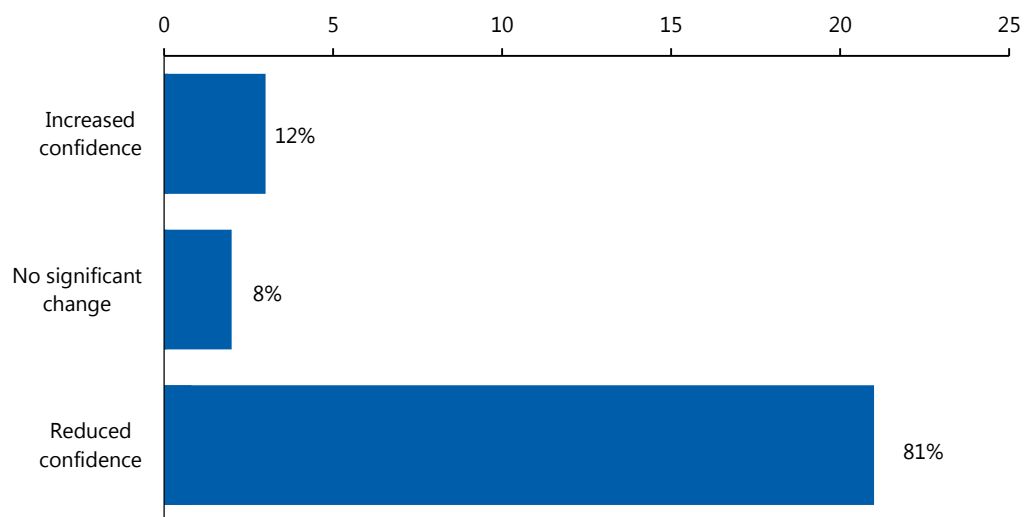


Notes: Multiple responses were given by some respondents

2.2.2.3. A2.3: How do you think the reduction in support for conventional biofuels will affect investor confidence in advanced renewable fuels?

Respondents indicated that the reduction in support for conventional biofuels will have the effect of reducing investor confidence in the industry. 81pc indicated confidence will be reduced, as opposed to 12pc who believe it will increase confidence and 7pc who believe there will be no significant change.

Figure 11 A2.3: How do you think the reduction in support for conventional biofuels will affect investor confidence in advanced renewable fuels?



2.2.2.4. A2.4: What is the primary reason for this? (Reference to A2.3)

The following reasons were provided to explain a reduction in confidence in the industry:

- Creates legislative uncertainty

- Undermines investments in first generation production facilities
- Both parts of the market – conventional and advanced – are required
- High prices for second generation biofuels could drive up fuel prices, leading to a reduction in support due to public concerns

The highest number of respondents pointed to legislative uncertainty as the primary reason for a reduction in investor confidence. Many pointed to historic changes in the RED legislation causing similar concerns so regarded this as a continuation. They highlighted a lack of scientific rigour and logic in setting legislation meaning future legislation is likely to change frequently. In addition, several respondents stated that the original RED has not achieved its original goal and the support is already planned for withdrawal. Another concern that was voiced by several respondents was the potential for high prices if second generation biofuels are mandated before the technology is ready. This could lead to increases in pump prices and a loss of public support, resulting in a change in the legislation to compensate.

Several respondents made the point that many conventional biofuels facilities are yet to pay back their initial investments and that restricting the conventional market through the falling cap and removal of the mandate undermines the profitability of these investments. This is likely to exclude these investors and operators from investing in the advanced biofuels market.

Two biofuel producers active in both the conventional and advanced biofuels markets highlighted the symbiotic advantages of production across the two sectors. Certain manufacturing models benefit from co-location of conventional and advanced production. Similarly it was stressed that conventional facilities could provide a foundation for the research and development of advanced production processes.

The following reasons were provided to explain an expected increase in confidence:

- Provides a clear target for advanced biofuels (scientific support for residual biofuels reduces future legislative risk; separate support for waste based)
- Provides opportunity for investors to acquire old plants and consolidate industry

A number of respondents explained an expected increase in confidence with the introduction of a clear target for advanced biofuels including waste-based biofuels. This allows for further development of the market, free of competition from conventional biofuels, which are often lower cost. In addition, the scientific evidence supporting the use of residues as feedstock for sustainable biofuels reduces the chance of legislative changes, and therefore lowers risk.

One respondent highlighted the opportunity available to investors as conventional biofuels plants become uneconomic, they may be converted to produce a mandated biofuel.

The following reasons were provided in support of the opinion there would be no significant change:

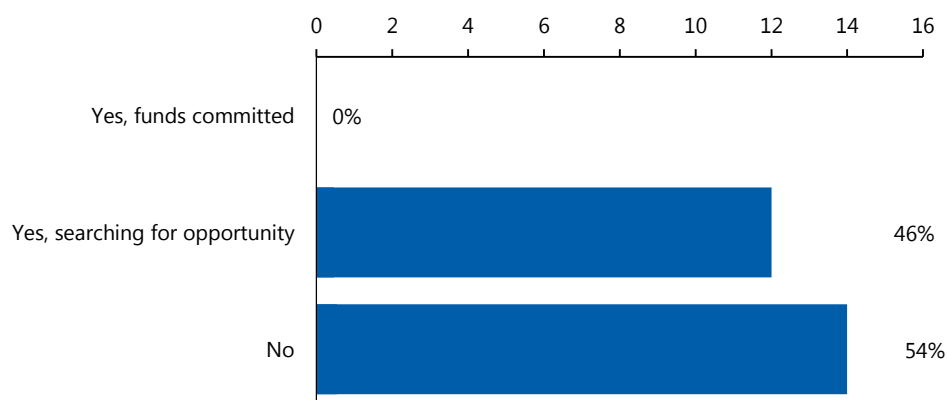
- Positive move to include other types of alternative fuels however the changes suggest a lack of certainty
- Changes to conventional support do not affect their view of advanced biofuel support

One respondent described how the positive and negative effects of the legislation would balance, resulting in no significant change from the current environment. Similarly, an advanced biofuels producer stated the changes to conventional biofuel support had no effect on their confidence in the advanced sector, even if they did not agree with the changes, as they do not think the same could happen to their sector.

2.2.2.5. A2.5 Do you plan to invest in advanced renewable fuels if the RED II proposal is transposed in to law?

No respondents indicated they had already committed funds investing in advanced renewable fuels based on the RED II proposal. Responses were fairly evenly split between those who were not planning to invest, and those that were searching for an opportunity.

Figure 12 A2.5: Do you plan to invest in advanced renewable fuels if the RED II proposal is transposed in to law?



One respondent stated that the RED II proposal was not the only factor affecting the decision of whether to invest in the sector.

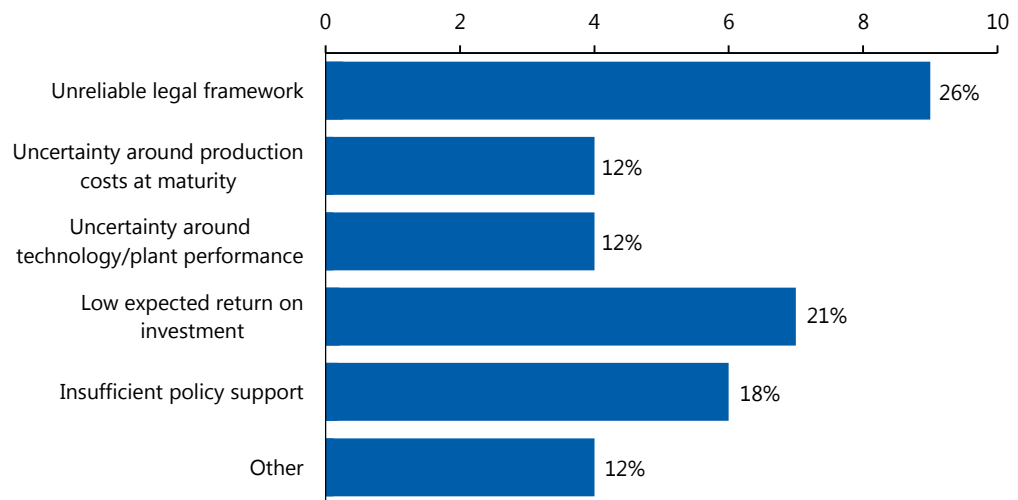
A number of respondents that selected "searching for opportunity" were not encouraged by the proposal but were looking for options to protect or make use of their conventional biofuel assets when the legislation changed.

A respondent that answered no to the above indicated they would be looking to invest outside of Europe.

2.2.2.6. A2.6: If no, what are the barriers preventing your company from investing in advanced renewable fuels, assuming a binding target for them is introduced?

Respondents who were not planning to invest in biofuels stated issues around legislative support and uncertainty around technology as the main barriers to entry. Specifically the reliability of policy support was the most common response, followed by low expected returns on investment.

Figure 13 A2.6: If no, what are the barriers preventing your company from investing in advanced renewable fuels, assuming a binding target for them is introduced?



Notes:

Multiple responses were given by some respondents

Other category made up of "no binding target", "no recognition of CO fuels", "UK leaving EU", "no feedstock for Part A"

2.2.2.7. A2.7: What changes to the proposal would be needed to make investment more attractive?

Most of the suggested changes to the proposal related to increasing the timeframe of legislation, increasing ambition and reducing regulatory risk. Specifically, the following changes were suggested by multiple respondents:

- Long term legal framework (15-20 years)
- No option for changes to support i.e. in 2025
- Do not reduce cap on conventional (crop-based) biofuels
- No cap on waste-based biofuels
- Increased target
- Clearer and wider definition of advanced biofuels
- More flexible with focus on GHG saving goals
- Remove option for varying Member States policies

The most common suggestion to make investment more attractive was increasing the time frame covered by the new regulations. There was no consensus on what an appropriate timescale would be, however 10 years was deemed too short, particularly considering the challenges of commissioning a production facility in time for the start of the support period in 2020. 15-20 years was suggested as a more attractive time frame. Similarly, the potential for changes to the list of feedstock and the legislative review in 2025 was said to create uncertainty for investors.

The suggestion to maintain support for conventional biofuels might be expected given the responses to question 2.3 regarding the effect of removing support on investor confidence. There are two drivers to this suggestion, firstly that by removing support for a type of biofuels suggests the same could happen to advanced biofuels in future. Secondly, the removal of symbiotic production between conventional and advanced biofuels production processes reduces efficiency and opportunities for research and development.

Another major theme was the lack of ambition displayed in the RED II proposal. Respondents suggested an increased target and removing the cap on waste-based (Annex IXB) biofuels would make investment more attractive.

Respondents suggested that innovation in feedstock processing is likely to be limited unless flexibility can be introduced to the list of permitted feedstocks. They have called for clearer and broader definitions of those permitted in each of Annex IX Part A and Part B. By providing a prescriptive list of feedstocks, they argue research in to new residual feedstocks will be severely reduced. This point is similar to the call made for greater flexibility and a focus on the ultimate goal of achieving reductions in GHG emissions. In its current state, the RED II does not reward biofuels with improved GHG savings and therefore there is no motivation for maximising these savings.

Based on the experience of meeting the original RED, a number of respondents suggested removing the option of allowing Member States the flexibility to make changes when transposing the directive into national law. Differences in trajectories in meeting targets and rules around double-counting, among other issues, have created uncertainty in how each market will develop. Removing this option improves predictability and reduces investment risk.

In addition, the following suggestions were also made by individual respondents:

- Classify waste-based biofuels as advanced
- Do not merge Part A and Part B of Annex IX
- Include waste fatty acids as permitted feedstock
- Clearer penalties for non-compliance
- Specific transport target
- Allow tax reductions rather than mandates, which apply roof to market
- Absolute targets rather than percentage mandates
- Price guarantee for each litre of biofuel produced
- Capital grant towards investment in production facility

While some of the above suggestions follow the themes mentioned previously, they are sufficiently different to warrant describing separately. Some conflict with other suggestions, such as the request to classify waste-based biofuels as advanced and the pre-emptive request to maintain Part A and Part B as separate groups rather than merge them.

Clearer penalties for non-compliance were suggested as a way of improving confidence that mandates will be met, providing further confidence in future levels of demand. Similarly, the lack of a specific transport target allows Member States to achieve the 2030 target through the power and heat sectors, undermining investor confidence who will require persuading there will be a market for biofuels.

Similar to the request around broader definitions of feedstocks, one respondent specifically wanted the inclusion of waste fatty acids, the use of which is becoming more common.

In recent years tax reductions for biofuels have been permitted as a way of encouraging demand, however they have now been restricted. One respondent highlighted their benefit of encouraging demand on an economic basis while not capping the potential market, as seen with mandates.

To combat the risk of declining motor fuel markets, the suggestion for absolute targets for blending was put forward, similar to the system currently in place in the US. This would provide further predictability for future biofuel demand, independent of the demand for total motor fuels.

Two suggested changes which were recognised as highly unlikely were for direct financial support, either through price guarantees for each litre produced or capital grants towards the cost of production facilities.

[2.2.2.8. A2.8: What were the reasons your organisation was initially interested in investing in advanced renewable fuels? Have these motivating factors become stronger or weaker over the past few years?](#)

The motivating factors stated can be broadly divided into three categories:

- Legislative drivers
- Business drivers
- Moral and/or environmental drivers

Legislative drivers

Respondents quoting European and national biofuels policy as the main driver typically said their motivation has weakened. A number of respondents quoted the initial RED as their primary motivation and noted the change in focus to non-crop biofuels, but frequent changes in legislation, the reduction in crop-based biofuel support and concerns around the RED II proposal, including the suitability of technology to meet it, have undermined their motivation. In addition, the move away from tax incentives was also stated as a reason for reduced motivation. However, some respondents quoting legislative drivers stated their motivation has been increased through rising mandates and an increasing need for double-counted biofuels.

The biofuels market represents a growth opportunity for companies not directly involved in the sector. One major agricultural group stated an interest in diversifying away from the core business, however this has become weaker. In contrast to this, a supplier to biofuels producers stated they expect market growth to be higher than in

the fossil fuel industry, which they also supply, and therefore their motivation has become stronger.

Business drivers

A company with business units involved in the pulp and paper, and forestry sectors stated that they were motivated to invest in advanced biofuels due to natural synergies with these different business activities. Despite uncertainty around the supporting policies, their motivation has remained the same.

A desire to provide supply independence was the primary motivation for a company in the fossil fuel sector, however they state that this has reduced.

Environmental drivers

A number of respondents stated moral and environmental motivations for interest in investing in advanced renewable fuels. Although, generally, the underlying drivers have been increasing as the global requirement to reduce carbon emissions has been increasing, these motivating factors are affected by legislation due to its effect on business profitability.

A number of respondents highlighted the need to reduce resource waste and produce useful biofuels from these waste streams. Typically, these have become weaker as the underlying legislation is due to remove support for these, which was previously underpinned by double-counting and GHG savings requirements. In addition, one SME stated the difficulty in competing in this field with larger companies due to the significant equity requirements.

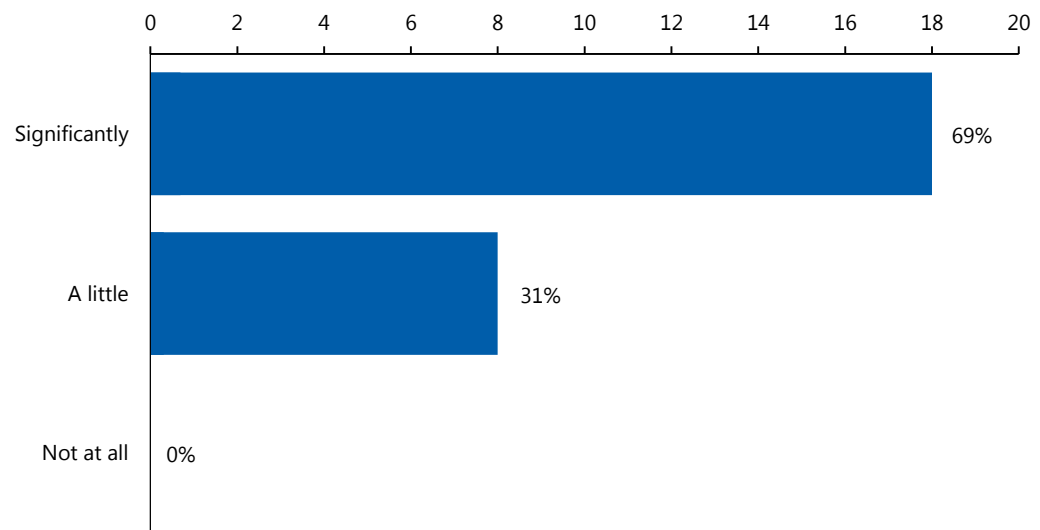
The need to reduce fossil fuel usage and carbon emissions was also frequently stated as a motivating factor. While with some respondents these have remained constant or increased, in line with global attitudes, several stated they have reduced motivations due to stagnant mandates pre-2020 and uncertainty around policy post-2020.

Finally, one respondent stated their company had no interest in investing in advanced biofuels, and this has not changed.

[2.2.2.9. A2.9: How significantly would the RED II proposal need to be changed in order to incentivise the necessary investment in biofuels to meet the advanced biofuels target?](#)

69pc of respondents stated that in order to meet the advanced biofuels target, the RED II proposal would be needed to be significantly changed. The remaining 31pc thought the proposal would be needed to be changed a little. No respondent thought the RED II proposal was capable of supporting the necessary investment in its current state.

Figure 14 A2.9: How significantly would the RED II proposal need to be changed in order to incentivise the necessary investment in biofuels to meet the advanced biofuels target?



2.2.2.10. A2.10: Do you have any other views on the future for advanced renewable fuels that you would like to share?

This question was presented as an opportunity for respondents to voice any other views that were not captured throughout the questionnaire. Responses can be summarised into the following themes:

- Additional comments concerning the RED II proposal
- Biofuels production technology
- Wider transport market

Additional comments from respondents concerning the RED II proposal

- Market fragmentation caused by differing legislation across Member States puts SME's at a competitive disadvantage compared to larger organisations
- It is expected that the list of Annex A feedstocks will be added to with feedstocks with lower production costs which will undermine existing investments
- Would like clarity on how much freedom Member States would have regarding setting targets
- Supports the use of the multiplier for aviation but needs to be higher than 1.2 to cover additional production step – factor of two would be more realistic
- Successful biofuels policy would result in reduction in fossil fuel use and therefore a reduction in price. Therefore, biofuels must be able to cope with low oil prices through effective communication of the advantages and maintenance of the long term policy

- The move away from first generation biofuels limits production options such as co-processing with second generation biofuels, HVO using existing refinery technology and development using existing facilities
- The term 'advanced biofuels' should be used to describe high GHG saving fuels, not the feedstock or production process
- The proposed GHG threshold does not provide incentive to exceed it so does not provide encouragement to use high performing biofuels or to improve the environmental performance of existing fuels
- The potential for advanced biofuels is high but requires a gradual roll out and cannot be relied on to replace first generation volumes
- The same companies involved in first generation biofuels are likely to be investors in second generation biofuels, therefore reducing support for first generation will have a significant effect on investor confidence
- The use of market oriented systems such as RINS in the US, which encourage the cheapest and best option to succeed, would be preferable over the proposed legislation
- The European waste hierarchy is restrictive and does not place sufficient importance on the biofuels sector, reducing the potential for increased production of waste-based biofuels

Biofuels production technology

- Much of the technology for advanced biofuels is not commercially available yet. The policy should support the biofuels industry so producers are able to take risks. Certain policies, such as carbon accounting (the process of calculating carbon emissions), are restricting the industry by limiting practices such as co-processing.
- The technologies to process Part A feedstocks are not ready yet so the industry and legislators must be patient rather than force through changes which could cause increases in fuel prices resulting in a loss of public support

Comments regarding the wider transport market

- Biofuels are deeply scrutinised but alternatives like electric cars are not to the same level. Electric vehicles effectively pay no tax on the fuel, while biofuels are taxed at normal rates
- Electric cars are expected to grow significantly which could take investment away from biofuels
- Biofuels cannot achieve the decarbonisation of the transport sector without contributions from other technologies and fuels, such as hydrogen and electricity. Biofuels could be focused on HGV and aviation sectors where other technologies are less strong

- The emphasis on diesel in the European transport fuel market should be addressed, which is starting to happen currently as the environmental issues become more apparent

Additional comments

- Biofuels were initially encouraged in order to support the agricultural sector by providing an outlet for large agricultural surpluses. A reduction in biofuels production could see this issue return

Chapter 2.3: Discussion of results

The survey set out to answer two main questions – will there be sufficient investment in advanced renewable fuels to meet the target in the RED II proposal, and what effect will the reduction in support for conventional biofuels have on investor confidence in advanced renewable fuels.

The majority of market participants surveyed did not believe the proposal would incentivise sufficient investment in biofuels production⁵. This corresponds with the majority of views that the reduction in support for conventional biofuels will cause a reduction in investor confidence.

The expectation from the biofuels industry that investment will be low in future runs counter to the results of the questions around interest in future investment. Many still see bioenergy, and specifically advanced biofuels, as an interesting field of future investment. In addition, many declared they are currently searching for an opportunity to invest in the sector. Both of these responses point towards a more positive reaction to the legislation which may be partially explained by examining the motivation for investing or participating in the market. It is worth noting, however, that a number of respondents stated they were investing in order to protect or make use of their conventional biofuel assets when the legislation changes, rather than being encouraged by the proposal.

When asked about their motivations for entering the advanced renewable fuels market respondents typically referred to legislative, business or environmental drivers. Those referencing previous and current legislation as the dominant drivers were typically the most opposed to the RED II proposal. Many have experienced the frequent changes to legislation over the previous decade and are therefore highly critical of future legislation for potentially permitting a similar situation.

Respondents stating business drivers, such as expansion into new sectors or synergies with other business units within the group, were less critical of the legislation but were less reliant on long term, stable legislation for economic operation.

Respondents stating environmental or moral drivers for involvement in advanced biofuels were typically the least critical of the legislation, while their motivations were less affected by uncertainty in the industry caused by legislation. Reducing carbon emissions and more effective use of waste materials are global drivers independent of European policy, so these companies continued to pursue these goals regardless of the EU legislation in force. Economically sustainable production was still stated as a serious concern, but they appeared unlikely to turn to other sectors due to unfavourable policy support. It is worth noting that while current and future biofuels policy has been highlighted by respondents as uncertain and a barrier to investment, the requirement to reduce carbon emissions at a European and global level has become more important.

⁵ Respondents were not asked what level of investment would be required, however the European Commission estimated it to be around €900mn/yr

Appendix A: Questionnaire

Chapter A.1: General Questions

A.1.1. Which of the following sectors does your business operate in?

- Conventional biofuels producer
- Advanced biofuels producer
- Agricultural business
- Financial institute (bank, institutional investor)
- Private equity
- Trader/broker
- Fossil energy industry
- Chemical industry
- Electricity generator
- Other (*please specify*)

A.1.2. Do you see renewable energy as a field of future investment? If so, which of the following are you interested in?

- Photovoltaics
- Wind
- Bioenergy
- Other (*please specify*)

A.1.3. Do you already invest in bioenergy? If so, have you invested in any of the following?

- Electricity generation
- Heating
- Transport
- Other (*please specify*)

A.1.4. Do you see bioenergy as an interesting field of future investment?
If so, which of the following are you interested in:

- Power generation
- Heating
- Advanced biofuels
- Conventional biofuels

A.1.5. Do you see Power-to-Gas (PtG) or Power-to-Liquid (PtL) as an interesting investment?

- Yes, definitely
- Yes, probably
- Not sure
- Probably not
- Definitely not

A.1.6. Which of the following facilities are you currently involved with or have you been involved in in the past?

- Conventional biofuels production plant
- Advanced biofuels production plant

Please provide further information, where possible (e.g. on the raw material used and/or process)

Chapter A.2: Specific questions on the RED II proposal (phase out of EU-support of conventional biofuels by 2030, a binding target of 6.8 % advanced biofuels by 2030)

A.2.1. Do you think the proposed targets for renewable fuels in the RED II proposal provide sufficient incentive to justify investment?

- Yes, definitely
- Yes, probably
- Not sure
- Probably not
- Definitely not

A.2.2. If yes, which of the following advanced renewable fuels are sufficiently incentivised to attract investment?

- Fuels from Annex IX Part A of the RED II proposal (straw, bio-waste, manure, sewage sludge, POME & EFB, tall oil pitch, crude glycerin, bagasse, grape marcs, husks, nut shells, corn cobs, non-food cellulosic material, forest residues)
- Fuels from Annex IX Part B of the RED II proposal (used cooking oil, tallow, molasses)
- Other renewable liquid and gaseous fuels (PtL / PtG, waste-based fossil fuels, renewable electricity)

A.2.3. How do you think the reduction in support for conventional biofuels will affect investor confidence in advanced renewable fuels?

- Increased confidence (e.g. focus on advanced renewable fuels)
- No significant change
- Reduced confidence (e.g. due to regulatory uncertainty)

A.2.4. What is the primary reason for this?

A.2.5. Do you plan to invest in advanced renewable fuels if the RED II proposal is transposed into law?

- Yes, funds committed
- Yes, searching for opportunity
- No

A.2.6. If no, what are the barriers preventing your company from investing in advanced renewable fuels, assuming a binding target for them is introduced? (multiple answers possible)

- Unreliable legal framework
- Uncertainty around production costs at maturity
- Uncertainty around technology/plant performance
- Low expected return on investment
- Insufficient policy support
- Other (*please specify*)

A.2.7. What changes to the proposal would be needed to make investment more attractive?

A.2.8. What were the reasons your organisation was initially interested in investing in advanced renewable fuels? Have these motivating factors become stronger or weaker over the past few years?

A.2.9. How significantly would the RED II proposal need to be changed in order to incentivise the necessary investment in biofuels to meet the advanced biofuels target?

- Significantly
- A little
- Not at all

A.2.10. Do you have any other views on the future for advanced renewable fuels that you would like to share?