### Document Control

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Enabling actions to scale up business innovation: ‘Reed bed harvesting for biofuel to enhance wetland biodiversity’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main author</td>
<td>Guy Duke, Workstream lead</td>
</tr>
<tr>
<td>Date</td>
<td>22 November 2016</td>
</tr>
</tbody>
</table>

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1 Introduction

‘Innovation for reed bed biomass fuel and biodiversity’ was previously identified (in 2015) as a ‘promising innovation’ through analysis carried out under the Innovation Workstream (WS2) of the EU Business @ Biodiversity Platform. Indeed, it was one of five innovations identified as ‘most promising’ from among 23 business innovations submitted to WS2 by Platform members in 2014 and 2015 (see Background, Annex 1).

This paper seeks to identify enabling actions (policy, regulatory or supportive measures) for the scaling up of business innovation related to reed bed harvesting for biofuel production to enhance wetland biodiversity. It should be read in conjunction with the previous detailed analysis of the opportunity, ‘Innovation for reed bed biomass fuel and biodiversity by FIELDFARE’.

The paper considers EU level enabling measures, both those already in place (e.g. relevant H2020 calls, COSME, policies for the Circular Economy, incentive for Biofuels use) and any further measures that may be taken to support this pro-biodiversity business innovation.

Consideration is also given to what may be done at Member State level and by companies themselves, within the existing policy and regulatory framework, and making use of existing EU-level enabling measures.

While this paper builds on the 2015 analysis of innovation by a particular company (FIELDFARE International Ecological Development plc) in a particular region (the lower Danube), it identifies enabling actions that should benefit a wide range of companies across Europe linked to innovation in this area.

By articulating more clearly potential enabling actions to be taken, WS2 aims to help move forward this promising area of innovation, for the benefit of both business and biodiversity, and thereby make a tangible contribution to the EU Biodiversity 2020 Strategy and broader EU sustainability, growth and jobs objectives.

The WG hopes that this paper will be of use to companies interested in reed bed harvesting, reed pellet production, the design, manufacture, sale and servicing of pellet boiler technologies, and biofuel uses of harvested reed. It will also be of interest to governmental and non-governmental organisations interested in reed bed harvesting for wetland diversity and biofuel production.

Background on WS2 is provided at Annex 1 and an overview of the Working Group’s approach and method for the preparation of this paper is provided at Annex 2.

ADDITIONAL DISCLAIMER: This paper has been prepared by a Working Group (WG4) made up of Platform members (see Approach and Method, Annex 2). This paper collates opinion from WG4 members and is not endorsed by the Commission.
2 Description of the innovation

This innovation relates to the production of biofuel from reed Phragmites australis beds in wetland areas such as the lower Danube, the Baltic coast and the Camargue.

Reed beds are important for nature conservation in Europe. The interest centres on rare breeding birds, rare phragmitofagous insects and plant species of conservation interest. However, a large proportion of reed beds in Europe are in unfavourable conservation condition, due to drainage or becoming overgrown.

In many areas cutting of reeds is necessary or a preferred management measure in favour of biodiversity notably to keep water and peatland areas open for wetland birds. Many species of course benefit from undisturbed reed beds so cutting is not always the best management option – careful assessment is required in each case. However, there are significant areas of overgrown reed beds in some parts of Europe, which as a consequence have reduced biodiversity and/or may be vulnerable to natural succession to other habitat types. In such areas, reed cutting, if done appropriately (e.g. creating a temporal and spatial mosaic of cut and uncut areas, and avoiding disturbance of breeding birds) has been shown to be beneficial for breeding birds, and is considered beneficial to nature in the long term by restraining the hydroseral (plant succession) process (which eventually leads to replacement of the wetland by woodland).

However, cutting of reeds is labour intensive and often far too expensive to undertake for biodiversity conservation purposes alone. One solution is to harvest and commodify reeds as a high energy and high margin biomass /biofuel source. This can, notably, be done through the production of reed pellets. These may be used as a substitute for wood chips or wood pellets. This can be particularly attractive in relatively remote areas like the steppic areas of Eastern Europe where the cost of transporting wood pellets is high.

The potential supply of reed pellets, market value and impact on jobs in Europe are significant. For example, if all the potential reed resource in the lower Danube region (c.170,000 ha) was harvested it would yield 0.5 m tons p.a. of reed pellet, with a market value of c. €55 m p.a. and employ 2000-2500 people in local micro-businesses.

While there has not been an assessment of reed bed area for the whole of Europe, there are significant reed bed areas elsewhere in Europe. For example, an INTERREG IIIA project Reed Strategy in Finland and Estonia surveyed coastal reed beds and identified 28,000 ha in southern Finland and 17,000 ha in NW Estonia. There is much greater potential for biomass production from reeds through the re-wetting of degraded, drained peatlands. The 17 most important peatland countries in Europe offer more than 238,000 km² (more than 10 times the area of the Lower Danube reed resource) of degraded peatlands, much of which could be re-wetted and restored to reed bed for reed biofuel and biodiversity.

Demand for fuel pellets suggests there is more than enough potential demand for the available reed pellet supply even if all European reed beds were harvested for pellet. Harvested reed may be used as a biofuel in other forms, for example in bales for direct combustion, or as feedstock for biogas production. The use of reed as a renewable biofuel, whether as pellets, bales or biogas, has the added advantage of helping companies and governments to reduce CO2 emissions.

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The commercial viability of reed bed harvesting can be enhanced by adding value, for example by using part of the harvested reed in composite construction materials, in arts/crafts, or as litter for cats and horses. Reeds may also be used as feedstock for the production of industrial chemicals and as a nutrient source for organic crop production. Value may also be added by capturing monetary benefits from the enhanced recreational and biodiversity values of harvested wetlands (e.g. through ecotourism). In some situations (e.g. Nordic shores), landowners may also be ready to contribute to the costs of reed cutting to enhance access.

In summary, this innovation aims at synergy between the cutting of reed beds for biodiversity and the harvesting of reeds for biofuel. Care must be taken to avoid over-exploitation of reed and consequent damage to biodiversity through the creation of large-scale demand for reed biomass. Implementation requires careful consideration of the legal and policy framework for both biodiversity and biofuels, and related issues such as agriculture and regional policy. This legal and policy framework, and other relevant enabling measures, are discussed in the remainder of this paper.

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3 The EU policy and regulatory framework

A wide range of EU law and policy, including overarching policy and law and policy relating to biodiversity, climate, other environmental issues, agriculture and energy is relevant to the concept of reed bed harvesting for biofuel and biodiversity. This law and policy provides a generally supportive framework, though there are also a number of constraints. It is also important to remember also that a wide range of national laws and policies, as well as different forms of land ownership, influence the management and use of reed beds.

3.1 Overarching EU policy

- The *Roadmap to a Resource Efficient Europe* (COM(2011)571), a key element of the *Europe 2020 Strategy* (COM(2010)2020), provides a direction of travel that is broadly supportive of this area of innovation. In particular, the *Roadmap* encourages proper valuation of natural capital, while reed bed harvesting offers a way to realise the value of natural capital in wetlands. The *Roadmap* also encourages the use of financial instruments such as payments for ecosystem services. Reed bed harvesting delivers a range of ecosystem services (in addition to production of biofuel), including improved carbon retention in wetland soils, improved water quality and enhanced biodiversity. Payment for these ecosystem services (e.g. through voluntary carbon offset payments, water charges) can enhance the commercial viability of reed harvest for biofuel production.

- In providing a renewable source of energy, the innovation is also consistent with the *General Union Environmental Action Programme to 2020 – Living well, within the limits of our planet* (Decision 1386/2013/EU), notably priority objective 2 ‘to turn the EU in to a resource-efficient, green and low carbon economy.’ The production of biofuel from reed as a renewable resource is both ‘green’ and ‘resource-efficient’, and reed-based biofuel is a low carbon fuel. Furthermore, it does not conflict with land use for food production.

- *Innovating for sustainable growth: a bioeconomy for Europe* (COM(2012)60) highlights the need for Europe to change its approach to the production, consumption, processing, storage, recycling and disposal of biological resources, in response to increasing global population, rapid depletion of many resources, increasing environmental pressures and climate change. Improving the environmental sustainability of primary production is central to this strategy. It seeks to ‘improve the knowledge base and foster innovation to achieve productivity increases while ensuring sustainable resource use and alleviating stress on the environment’ and supports the ‘supports the development of production systems with reduced greenhouse gases (GHG) emissions.’ This provides a supportive general context for the sustainable harvesting of reed beds, which is an environmentally sustainable form of primary production that alleviates stress on the environment and reduces GHG emissions.

3.2 Biodiversity policy and nature law

- The *EU Biodiversity Strategy to 2020* (COM(2011)244) places emphasis on the need for the restoration of nature in Europe. Target 2 of the strategy is that ‘By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems.’ The harvesting of reed beds for pellets and other uses can contribute significantly to the restoration of degraded wetland ecosystems.

- The *Habitats Directive* (92/43/EEC) and the *Birds Directive* are relevant in that many reed beds fall within the Natura 2000 network or host protected species. The harvesting of reed beds can be an appropriate management action to restore Natura 2000 wetlands and/or wetland protected species to favourable conservation status.
On the contrary, harvesting of reed beds within certain Natura 2000 sites or other wetlands may be constrained, with a view to maintaining favourable conservation status of protected sites or species. All harvesting of reed beds should be independently monitored to ensure beneficial outcomes for biodiversity.

### 3.3 Other environmental law

- The **Water Framework Directive** (2000/60/EC), which requires EU member states to achieve good quality status of all water bodies (including marine waters up to one nautical mile from shore), is relevant in that reed bed harvesting can enhance water quality. River basin management plans prepared under the Directive can incorporate the harvesting of reed beds as a means to enhance biodiversity and water quality, improve flood control and mitigate climate change.
- The harvesting and good management of reed beds is relevant to the **Floods Directive** (2007/60/EC), because overgrown or degraded or drained reed beds can increase flood risk, while healthy reed beds can reduce flood risk. Moreover, the Directive drives the restoration of flood plains, which may be done with the intention of harvesting reeds as a new economic activity.

### 3.4 Agricultural policy and law

- The **Regulation on the Financing, Management and Monitoring of the Common Agricultural Policy** (Regulation 1306/2013) provides for both direct (area-based) payments to farmers. The **Rural Development Regulation** (Regulation 1305/2013) provides for payments to farmers for ‘agri-environment measures’.
- Reed is, however, not currently classified as ‘agricultural product’ under Annex 1 to Commission Regulation 1006/2011 of the **Treaty** (on the Functioning of the European Union, TFEU). This means that the maintenance reed bed areas are not currently eligible for direct payments. This makes reed production for biofuels less competitive than drainage and conversion of reed beds to grassland or arable land. Moreover, the rewetting of abandoned arable land or pastures located in former wetlands is not supported.
- The ‘greening’ of the CAP may offer potential for ‘green direct payments’ to farmers to retain and manage reed beds in a sustainable way (including appropriate harvesting for biofuels). Green direct payments make up 30% of a country’s total direct payments. However, further work is required to clarify the potential to apply green direct payments for reed bed restoration, retention and management.
- Payment for the restoration, management and harvesting of reed beds can be eligible for funding through agri-environment measures. These measures pay for the environmental co-benefits of land management. For example, in Poland, agri-environment supports the use of special cutting machinery to cut reed beds to maintain habitats for ground-nesting birds. The design and implementation of such agri-environment schemes lies largely in the hands of Member States, within the framework provided by the Regulation.

### 3.5 Energy policy and law

- Innovation for use of reeds as biofuel is consistent with the **Roadmap for Moving to a Competitive, Low Carbon Economy in 2050** (COM(2011)0112), which calls for greater use of biomass (such as reeds) in energy production.
- The use of biofuels is incentivised by the **Renewable Energy Directive** (2009/28/EC) and the **Fuel Quality Directive** (2009/30/EC) with targets set for 2020 (any potential follow up is yet to be decided). Biomass from reed may be considered “non-food cellulosic material” in the sense of Art.2 of the RED. It benefits from being classified as a feedstock for advanced biofuels according to Annex IX Part A. Thus, it should contribute to meeting a dedicated target set under the RED for biofuels produced.
from Annex IX Part A feedstocks, which is set at a level of 0.5% of overall transport energy. Reed biomass could also potentially contribute to the target set under the FQD to reduce GHG intensity of transport fuels by 6% against a 2010 baseline. Biomass from reed can only contribute to these targets if it complies with the sustainability criteria for biofuels under the RED and FQD, *inter alia*, that feedstocks are not to be obtained from: (a) wetlands that are converted to non-wetlands; (2) zones legally protected for nature conservation or areas designated for protection of species or ecosystems (however, where evidence is provided that the production of raw material does not interfere with nature protection, it may be used); (c) peatland (unless evidence is provided that cultivation and harvesting of that raw material does no involve drainage of previously undrained soils). For the period post-2020, consideration is being given to whether feedstocks from all peatland should be banned; such a ban would rule out reed from certain habitats. It should be noted however that the RED and FQD provisions relate to reed being used for advanced transport biofuels, and not in the form of reed bed pellets for heating.

- Working with the European Committee for Standardisation (CEN), the EU aims to develop and improve the technical quality standards of biofuels (and of biofuel blends for vehicle engines).
4 Potential enabling measures relating to the policy/ legal framework

While the existing policy and legal framework does not specifically encourage reed harvesting for biofuels and biodiversity, it is, as outlined above, broadly supportive of this innovation. However, a number of enabling measures relating to existing law and policy might be taken to support the scaling up of reed bed harvesting for biofuel production, to meet the full potential of this innovation both for business and for biodiversity.

The Working Group considers that the uptake of reed bed harvesting for biofuel production and biodiversity might be stimulated by the following measures:

- **Give greater attention to reed (and other non-wood) biomass under the Renewable Energy Directive and consider introducing standards for reed pellets.** Biofuel policy and especially biofuel blending mandates at member state level have focused to date on agricultural products such as food crops as sources (so called ‘first generation’ biofuels). Wood and other biodegradable fractions of products, waste and residues of biological origin have also received some attention as sources of biomass. Greater attention should be given non-wood biomass like reed (and others), and where appropriate to scale up use of these renewable sources (as a contribution to reducing greenhouse gas emissions). There may be a need for a EU-wide certification system to foster biodiversity-friendly reed cutting.

- **Classify reed as an agricultural product** and thereby open the possibility of ‘direct payments’ for reed bed retention and management under the Common Agricultural Policy. Direct payments for high water tables on organic soils would also enhance reed bed maintenance and harvesting.

- **Enhance agri-environment funding for restoration, management and harvesting of reed beds.** There is scope to make much greater use of agri-environment funding to encourage the restoration, management and harvesting of reed beds, both to produce biofuels and to make use of reeds as a mulch to add organic matter to soils. Member States should promote this in their agri-environment programmes.

- **Allocate greening payments under the Common Agricultural Policy for the use of cut reed to add organic matters to soils** (this is being tested by the Reedfield project in Finland). France has launched the 4‰ Initiative which aims to halt the increase in atmospheric CO2 by increasing the soil carbon stock by 4‰ p.a.⁷ Mulching of soils with cut reed (which is c. 50% carbon) can contribute to such programmes.

- **Remove Common Agricultural Policy subsidies for conversion of reed beds.** At the very least, subsidies should not be provided for the conversion of reed beds to other agricultural uses (e.g. grasslands), except where this has clear biodiversity benefits (e.g. to restore coastal meadows for rare breeding birds where these areas that were previously meadows have become overgrown by reeds).

- **Improve implementation of the Nature Directives in Natura 2000 sites with reed beds, to enhance benefits for biodiversity and business.** Management planning for such sites is often inadequate or poorly implemented, and there is potential for greater integration of reed harvesting to benefit both biodiversity and business. This may in some cases require adaptation of national law transposing the nature directives to allow greater flexibility in reed bed management. Greater monitoring and enforcement of management planning and implementation is required from

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⁷ [http://4p1000.org/understand](http://4p1000.org/understand)
Member States’ authorities to encourage appropriate harvesting of reed beds and delivery of favourable conservation status for priority habitats and species. Provision of adequate **financing** is key to this. Additional **research** on the biodiversity and ecosystem services effects of reed cutting is required to underpin appropriate cutting regimes in Natura 2000 sites.

- **Adjust Member States’ (and Neighbourhood countries’) laws to incentivise restoration of reed beds to enhance biodiversity and where appropriate for harvesting and biofuel production.** Member State laws and laws in key Neighbourhood countries (e.g. Ukraine) can constrain harvesting of reed for biofuel. For example, in Germany, a reed cutting directive constrains cutting of reed beds, which are considered a protected biotope. Similarly, reed bed harvesting in the Danube Delta is governed in Romania by a special regulation, with the main aim of conserving biodiversity. Such regulations may be appropriate for existing reed beds in good condition, but can constrain investment in the rewetting, restoration and harvesting of degraded reed beds. This can be counterproductive both for business and for biodiversity. Consideration should be given to relaxing such constraints.

- **Increase taxation on fossil fuels.** This would indirectly make the use of biofuels, including reed-based biofuels, more commercially viable. Notably, the recent increase in gas prices in Ukraine to EU levels (following EU-brokered talks with Russia) has led Ukraine to adopt energy security, energy saving and energy replacement strategies, including encouraging local authorities to install biomass boilers to heat public buildings.⁸

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⁸ Cabinet of Ministers of Ukraine **National Renewable Energy Action Plan up to 2020.** Executive Order No. 902-p of 1 October 2014.
5 Other potential enabling measures

5.1 EU finance

A range on existing EU financing measures exist which offer opportunity to finance research, technological development and innovation of relevance to reed bed harvesting for biofuel production. These include instruments for research and innovation under Horizon 2020, the LIFE programme including the Natural Capital Finance Facility, European Regional Development Funding (notably through INTERREG Europe) and funding under the Common Agricultural Policy.

There is also growing EU policy interest in innovative funding instruments including payments for ecosystem services and biodiversity offsetting, which may offer future financing opportunity for reed bed harvesting and management.

In addition to the various opportunities identified below, there is a need for Member States and private investors to provide tailored investment (e.g. for machinery, business planning) for entrepreneurs wishing to develop businesses related to reed bed harvesting and biofuel production.

Scaling up of reed bed harvesting for biofuel production would benefit from further research, development and innovation in a number of areas including, but not limited to: (a) determining the best harvesting rotation for reed beds in different types of locations; (b) best harvesting periods to reduce chlorine and ash content; (c) improvements in pelleting machinery for non-wood biomass sources; (d) optimal transport of reed biomass from the harvest area to the biofuel production area and to the biofuel consumption area; (e) optimal pricing of reed biofuel to grow demand; (f) reduction of regulatory constraints; (g) piloting and market replication of innovative business models for the commercialisation of reed biofuel. A range of H2020 funding instruments offer opportunity to tackle these issues.

H2020 funding for research and innovation on TN nature may potentially be provided in relation to topics under relevant Societal Challenges, notably SC5 ‘Climate action, resource efficiency and raw materials’, ‘Climate action, resource efficiency and raw materials’ and ‘Secure and clean energy.’ Interested organisations should seek to influence the selection of a suitable topic for the 2018-19 work programme, which is currently in preparation.

- The WG considers that companies and other interested parties (including academia) might seek to introduce a relevant topic addressing reed bed harvesting under the SC5 biannual work programme (2018-19) and SC5 call for proposals (2018 or 2019).

Funding might be secured to pilot and demonstrate innovation and replicate markets under the H2020 SME Instrument. This provides phased funding (up to 70% EU contribution) for SME innovation (Phase 1, €50000 EU contribution for feasibility studies; Phase 2, €500,000 to €2.5 million EU contribution for innovation development and demonstration). Innovation for reed bed harvesting for biofuels and biodiversity is relevant to current topics under the SME Instrument including: SMEInst-07-2016-2017 (Stimulating the innovation potential for SMEs for sustainable and competitive agriculture, forestry, agri-food and bio-based sectors) and SMEInst-11-2016-2017 (Stimulating the innovation potential for SMEs in the areas of climate action, environment, resource efficiency and raw materials). The SME instrument is open to individual SMEs or SMEs operating in small consortia. Successful proposals need to demonstrate, among other things, the novelty of the innovation, strong potential supply and demand and strong potential for scalability of the innovation. SME Instrument proposals can be submitted throughout the year with a number of cut-off dates each year.

- The WG considers that SMEs might submit proposals under the SME instrument, for innovations relating to reed bed harvesting for biofuels and biodiversity.
Enabling actions to scale up business innovation:
‘Reed bed harvesting for biofuel to enhance wetland biodiversity’

**COST** (a H2020 funded instrument) funds research networks (typically c. €130,000 p.a. for 4 years) with an emphasis on research and technological development with potential for European-scale impacts. COST pays for networking activities including working group meetings, exchange visits, database construction and communications activities (but does not pay for research *per se*, nor for participants’ time).

- The WG considers that companies and other interested parties (government agencies, NGOs, academia) might submit a proposal for a COST Action to support networking across Europe among entities working on reed bed harvesting for biofuel and biodiversity.

The **Knowledge and Innovation Community (KIC) InnoEnergy** supports innovation for sustainability of energy supply and may potentially be a source of finance for innovation in reed bed harvesting for production of reed pellets. The KIC supports Innovation Projects to bring together ideas, inventors and industry in collaboration to enable commercially viable products and services that deliver real results. The KIC also supports Business Creation Services to help entrepreneurs and start-ups that are creating sustainable businesses to grow rapidly to contribute to Europe’s energy ecosystem. However, approaches to KIC InnoEnergy by companies working on reed bed harvesting for biofuel production have as yet been unfruitful.

- The WG considers that companies and other interested parties might seek to engage in the KIC InnoEnergy as an excellence-driven innovation hub with a view to scaling up of reed bed harvesting for biofuel and biodiversity.

**5.1.1 LIFE**

**LIFE Nature & Biodiversity** (sub-programme for Environment) will co-finance action grants (EU contribution is 60% or up to 75% where priority habitats or species are involved, which is likely to include most reed beds) for best practice, pilot and demonstration projects that contribute to the implementation of the Birds and Habitats Directives and the Biodiversity Strategy to 2020, and the development, implementation and management of the Natura 2000 network.

Project topics under LIFE Biodiversity for the period 2014-17 include projects aimed at implementing Target 2 of the Biodiversity Strategy. This includes a topic on ‘restoring ecosystems by applying the Restoration Prioritisation Framework’ that potentially allows for best practice, pilot and demonstration projects on reed bed harvesting for wetland restoration (within the EU) where this can be shown to be consistent with the Restoration Prioritisation Framework.

LIFE Biodiversity also includes a topic on ‘pilot or demonstration projects using innovative ways of direct or indirect financing (including public and private partnerships, fiscal instruments, biodiversity offsets etc.) for biodiversity-related activities in the public and private sector.’ Reed bed harvesting projects might potentially be framed as innovative ways of direct or indirect financing.

As an example, the WG identified a possible pilot project in southern Finland, for the planning and management of reed harvesting to optimise, for biodiversity, the balance between reed beds and coastal meadows, with use of the cut reed for both biofuel and nutrient cycling. This would involve working with local landowners, and identification of options for long-term financial sustainability including agri-environment funding and marker-based approaches (e.g. auctioning of cutting ‘packages’ of 200-500 ha).

- The WG considers that companies and other interested parties (NGOs, government agencies, etc.) might submit LIFE proposals to pilot and/or demonstrate approaches for reed bed harvesting for biofuels and biodiversity.

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5.1.2 **Natural Capital Finance Facility**

The Natural Capital Financing Facility (NCFF) is a financial instrument that combines EIB financing and European Commission funding under the LIFE Programme. The NCFF contributes to LIFE objectives in particular relating to nature and biodiversity and to climate change adaptation.

Projects supported by NCFF will promote the conservation, restoration, management and enhancement of natural capital. This includes ecosystem-based solutions to challenges related to land, soil, forestry, agriculture, water and waste.

The NCFF will provide financial support to projects in order to generate revenue or save costs. In doing so, the Facility aims to prove to the market and to potential investors the attractiveness of biodiversity and climate adaptation operations in order to promote sustainable investments from the private sector.

The NCFF employs a range of different financing options for different projects, including debt and equity financing as well as direct and intermediated funding. The pilot phase of the NCFF project will last 3 years (2014-2017) with up to EUR 125 million being made available for investments in 9–12 operations. A Support Facility of EUR 10 million provides grant funding for technical or financial intermediaries for project preparation, implementation, monitoring and evaluation. Targeted projects must be located in the EU-28 and ideally have a size of EUR 5-15 million.

- The WG considers that companies and other legal entities innovating in relation to reed bed harvesting for biofuel production and biodiversity might seek NCFF support, in particular in relation to the following two NCFF priority areas: (a) payment for ecosystem services (e.g. programmes to protect and enhance biodiversity, to enhance water quality); (b) pro-biodiversity and adaptation businesses (e.g. sustainable agriculture, eco-tourism).

5.1.3 **European Regional Development Fund (ERDF)**

The INTERREG Europe programme (2014-2020) offers funding for to public and private non-profit bodies to enhance regional development policies and programme. Support is provided in relation to a number of ‘priority axes’, which include (1) research, technological development and innovation, (2) enhancing the competitiveness of SMEs, (3) supporting the shift towards the low carbon economy in all sectors, and (4) protecting the environment and promoting resources efficiency.

While it does not fund private enterprise, INTERREG Europe provides an opportunity for regional governments to explore ways to reduce regulatory and other constraints on reed bed harvesting for biofuels, and to stimulate farmer interest in such harvesting. There have been relevant projects funded under previous INTERREG programmes, including COFREEN – *Reed for Bioenergy and Construction* (INTERREG IVA 2007-13).

- The WG considers that regional governments (and other eligible parties) might submit a proposal to INTERREG Europe to explore ways to encourage uptake by companies, at regional scale, of reed bed harvesting for biofuel production and biodiversity.

5.1.4 **Funding under the Common Agricultural Policy**

As already mentioned, there is scope for Member States to make better use of agri-environment funding to compensate farmers and landowners for environmental co-benefits delivered by appropriate management of reed beds, including appropriate cutting regimes.

- The WG considers that Member States might provide agri-environment funding to support reed bed harvesting for biofuel production and biodiversity.
As also mentioned above, there would be scope for direct payments to farmers and landowners under the CAP for reed beds if reed were to be listed as an agricultural product under Annex 1 of the Treaty.

- The WG considers that the Commission should give consideration to the feasibility and impact of amending Annex 1 of the Treaty accordingly.

### 5.1.5 Other sources of finance that can be enabled by action at EU and Member State levels

While H2020, LIFE and agri-environment funding can provide short- to medium-term funding, there is a need for longer-term innovative financial solutions to make the production of biofuel from reed sustainable.

There is increasing interest at EU level and in many Member States in payment for ecosystem services. For example, there are a number of examples where water companies pay landowners to manage land in ways that enhance water quality and flow.\(^\text{10}\)

- The WG considers that the Commission and Member States should give thought to the use of water charges and payment for ecosystem services to pay landowners to maintain healthy reed beds (including through appropriate cutting regimes) to maintain water quality.

Biodiversity offsetting (to compensate for the negative residual impacts of development on nature) may also offer potential for longer-term financing of reed harvesting for biofuel production and biodiversity. One study estimated the potential EU offset market to be in the range of €750 to €7.5 billion p.a.\(^\text{11}\) If such a market were to become a reality, it could generate tens of millions of Euros p.a. of investment for the management of reed beds. This could involve the establishment of large reed bed habitat banks.

- The WG considers that the Commission and Member States might give further thought to the potential to secure longer-term finance for the harvesting and management of reed beds to deliver enhanced biodiversity through biodiversity offsetting.

### 5.2 Standards and tools

Existing pellet standards are not well suited to promoting the scaling up of reed bed pellets for fuel use. The focus is almost entirely on wood or crop residues.\(^\text{12}\) While some attention has been paid to cultivating exotics like Miscanthus or Paulownia, reed is a natural, indigenous renewable resource that has been largely overlooked as an independent source of biomass with associated ecosystem service benefits. This innovation could be leveraged by public sector promotion of a wider range of biomass pellet types than just wood (much of which EU has to import from North America and Russia). EU standards should become more descriptive quality grades, so that customers can decide what type of pellet they need and boillermakers can supply appropriate equipment. The EU pellet standard is currently a single ‘in or out’ category derived from wood pellets. Biomass from reed has 80% of the calorific value of wood, somewhat higher chlorine emissions and higher ash content. This makes reed pellet unsuitable for general domestic use, but it can be used for greenhouses, industrial heating, and other large buildings with external boiler units. These issues are being increasingly addressed as part of the EU 2030 Energy Strategy commitment to achieve 27% share of renewable energy consumption by 2030.

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\(^\text{11}\) Duke, G. et al. (2013) *EMTF 2\textsuperscript{nd} Phase Research: Opportunities for UK business that protect and/or value nature*. Final Report. ICF GHK, London

• The WG considers that the commission and Member States might:
  o Stimulate more significant demand for reed pellets, by putting in place new standards for pellets of various grades and policy support for the wider use of reed bed pellets (and other reed biofuels).
  o Stimulate the installation of appropriate boiler equipment, allowing uptake for a range of industrial heating purposes.
  o Stimulate the restoration and maintenance of healthy reed beds (including harvesting for biofuel production) through the setting of appropriate standards or controls for ‘good ecological status’ of waters, under the Water Framework Directive. If these standards and controls are set, in regions with significant reed bed areas, to ecological parameters that correlate to healthy reed beds, then overgrowth of reed beds is likely to cause a departure from these standards, triggering management actions to restore the health of the reed beds and restore water quality.

5.3 Guidance, sharing of good/best practice, awareness raising, training and capacity building

There are no existing EU guidelines on the harvesting of reed beds for biofuel production and biodiversity, nor any EU level initiatives to share best practice or promote knowledge exchange. However, a number of EU funded projects have helped to build good practice and facilitate knowledge exchange, largely at regional scales. This includes, notably, the COFREEN project (funded under INTERREG IVA 2007–13) which has produced a Guidebook of reed business.13 A previous INTERREG II A project in Finland and Estonia produced a useful reader on reed.14

There are also various national and local initiatives of relevance. For example, the website of Finland’s environmental administration lists a large number of materials (mostly in Finnish) on the management and use of reed beds on its website.15 The University of Greifswald / Michael Succow Foundation head up an informal network under the general themes of promoting paludiculture and reeds as a renewable resource.16 Ukraine is now part of a small project that received funding from the Eastern Partnership Civil Society Forum to look at paludiculture potential in Ukraine, Moldova and Georgia.

• Building on the above, the WG considers that interested companies or Member States might implement the following enabling actions:
  o Produce guidance (e.g. a business-initiated industry standard) for the management and restoration of reed beds (notably within Natura 2000 sites) for biodiversity and biofuel production, including the design of appropriate agri-environment measures;
  o Set up a ‘Euroreed’ website to share good practice and promote knowledge exchange;
  o Commission a pan-EU study on the potential of wetland biomass, not just from existing reedbeds, but also from potential floodplain restoration/rewetting schemes;

15 At http://www.ymparisto.fi/fi-Fi/Ruoko/Julkaisut/Aakkosjarjestyksessa
- **Support awareness-raising initiatives** among farmers, landowners and regional authorities in major reed bed areas to strengthen understanding of the benefits of reed bed harvesting and the negative effects of drainage and of overgrown reed beds.

The KIC InnoEnergy supports innovation for sustainability of energy supply and potentially may be a source of support for innovation in reed bed harvesting for production of reed pellets. This includes support for education to help create an informed and ambitious workforce that understands what sustainability demands and industry needs.

- **The WG considers that the European Commission might work with appropriate stakeholders to establish a knowledge cluster on reed bed biomass, linked to KIC InnoEnergy.** This knowledge cluster could address all major reed bed areas in Europe, or might focus on the Lower Danube and work in support of the Danube Regional Strategy Action Plan, **Priority Areas 2 (Energy) and 6 (Biodiversity, landscapes and the quality of air and soils).**
Annex 1  Background on Workstream 2 Innovation, and approach and method of the Working Group

A1.1  Background on WS2

WS2 aims to promote innovation that contributes to nature and biodiversity conservation and provides business opportunities.

WS2 Year 1 work (2014) gathered and showcased (on the B@B Platform website) 21 innovations received from Platform members and observers.

WS2 Year 2 work (2015) broadened the number of innovation case studies and dug deeper into a sub-set of these cases to assess how best to scale up the most promising partnership models. Six new cases were received. 20 of the total 27 cases were rapidly assessed for likely benefit to business, likely benefit to nature, and scalability and feasibility (those not assessed were either platforms, or provided insufficient information). The rapid assessments are available on the website. Based on this rapid assessment, seven ‘most promising’ innovations were selected for deeper analysis. This considered: the scale of the potential opportunity for business; the scale of the reduced risks or potential gains to nature; ease of implementation and practical opportunities for enabling growth; and the underpinning economic case for the innovation. The output was five ‘Analysis of Opportunity’ papers:

- CDP EUROPE: an environmental reporting system for the food, beverage and agricultural food chain;
- Innovative tools for natural capital accounting and mapping to support land management decision-making, from AECOM (for National Grid) and Landmarc Solutions.
- Water micro-pollutant treatment innovations, from SUEZ (‘ZHART’ constructed wetlands) and Dryden Aqua (Activated Filter Media - AFM);
- Temporary Nature innovation, from Tractebel Engineering (ENGIE); and
- Innovation for reed bed biomass fuel and biodiversity, by FIELDFARE.

Together, these five areas of innovation:

- offer very significant opportunities for benefits to business, jobs and growth including € 10s to 100s of billions GVA per annum, 10s of thousands of jobs, significant potential to de-risk business and significant potential to enhance business sustainability – all five areas can contribute significantly to the emerging EU ‘restoration economy’;

- offer potential for significant contribution to halting and reversing the decline of biodiversity and ecosystem services, including the restoration of 100s of thousands of hectares of habitat, enhanced diversity and abundance of species, and significant restoration of a wide range of ecosystem services in terrestrial, freshwater and marine environments;

- are scalable and feasible, with specific opportunities for public sector leverage and in particular potential for EU level action linked to relevant policy windows; and

- are in line with the general direction of travel in EU policy, with robust underpinning economic rationale.

17 A recent study of the benefits of the US restoration economy found that each $1 m invested creates 33 direct jobs, with an employment multiplier of 1.6-3.8 and output multiplier of 1.5 to 2.6. See: BenDor et al. (2015) Defining and evaluating the ecological restoration economy. *Rest Ecol* 23(3): 209-219.
Annex 2  Approach & method

A2.1  Approach

This paper was prepared by a Working Group (WG4) facilitated by the WS2 Lead. The WG was set up in April-May 2016 and finalised this report for presentation at the EU B@B Platform Conference on 23 November 2016 in The Hague, Netherlands.

This paper builds on detailed analysis carried out by WS2 in 2015 reported in the paper ‘Innovation for reed bed biomass fuel and biodiversity, by FIELDFARE’. The 2015 paper provides a detailed description of the innovation and an assessment of: the scale of the potential opportunity for business; the scale of the reduced risks or potential gains to nature; ease of implementation and practical opportunities for enabling growth; and the underpinning economic case for the innovation.

Membership of the WG included the businesses involved in the Year 2 detailed analysis, and others drawn from Platform members and from the wider business community, as well as interested observers, representatives and Member State participants. Membership was established following an open call via the B@B website and direct mailed to WS members.

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<tr>
<th>Working Group Members (* written input submitted)</th>
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<tbody>
<tr>
<td>• EUROPEAN LANDOWNERS’ ORGANISATION (ELO) – Marie-Alice Budniok (BE)</td>
</tr>
<tr>
<td>• ELY CENTRE FOR SOUTH-WEST FINLAND – lilo Ikonen (FI)*</td>
</tr>
<tr>
<td>• FIELDFARE – Paul Goriup (UK)*</td>
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<td>• LEISURELANDS – Adriaan van den Linden (NL)</td>
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<td>• MICHAEL SUCCOW FOUNDATION and GREIFSWALD UNIVERSITY – Wendelin Wichtmann / Andreas Haberl (DE)*</td>
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<tr>
<td>• NATIONAL ACADEMY OF SCIENCE – Oleg Rubel (Ukraine)*</td>
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<tr>
<td>• NATUREPARTNER srl – Mihai Adamescu (RO)*</td>
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<td>• PRO-BIODIVERSITY BUSINESS SERVICES Sp. z o.o – Zenon Tederko (PO)*</td>
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<td>• THE PROJECT ENGINEERING COMPANY Ltd. – Nick Ash (UK)</td>
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<td>• TURKU UNIVERSITY OF APPLIED SCIENCE – Pekka Alho (FI)*</td>
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There are inter-connections between this innovation and the work of the B@B Platform Workstream 1 (WS1) Natural Capital Accounting and Workstream 3 (WS3) Finance. The WG for this took account in particular of WS3 outputs from years 1 and 2 as well as parallel work under WS 3 in year 3.

A2.2  Method

The WG carried out the following tasks:

1. **Agree the scope of the WG** in terms of the business innovation(s) addressed and identify the ‘Community of Practice’ (with a focus on businesses) relating to the innovation(s).

2. **Identify**: (a) the EU policy and regulatory framework relating to the innovations; (b) any provision within the existing policy and regulatory framework that might enable up-scaling of the innovation; (c) any constraint to up-scaling of the innovation arising from this framework; and (d) any policy and/or regulatory change required at EU level to better enable up-scaling, and how this might be achieved.

3. **Identify**: (a) any existing non-regulatory measures (such as financing, standards, tools, sharing of best practice, knowledge exchange, etc.) available at EU level that may enable up-scaling of the innovation; (b) any constraint to up-scaling of the innovation arising from these measures (or the absence of such measures) and (c)
Enabling actions to scale up business innovation:
‘Reed bed harvesting for biofuel to enhance wetland biodiversity’

any new non-regulatory measure required at EU level to better enable up-scaling, and how this might be achieved.

4. **Refine the rationale**, in terms of benefits to business, jobs and growth, and benefits to nature and to wider society, to justify any proposed policy/regulatory and/or non-regulatory measures.

The WG operated remotely, facilitated by the WS Lead. Specifically, the WS Lead carried out the following tasks for the WG:

1. **Draft a paper and invite comment** from WG members (Jun-Aug 2016).
2. **Revise the paper** based on WG input and further desk research (Aug-Oct 2016).
3. **Invite final WG comment** on the revised paper (Oct-Nov 2016).
4. **Finalise the paper** based on the comments of the WG (mid-Nov 2016).