New business models and pathways for Dutch agrifood transition

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Introduction

The Dutch agrifood regime is grinding to a halt. International economic pressures force Dutch farmers to further scale up and intensify their businesses, while food scandals and calamities as well as many and varied negative environmental impacts have led to an all-time low societal acceptance of the agrifood regime as well as a host of legislative measures to stifle further growth. Such a situation, in which regime pressures increasingly undermine the regime, represents a strong call for transition of the Dutch agrifood system.

At the same time, new business models emerge: new players arrive, new logistical pathways come to the fore and innovative consumer and farmer relationships – food co-operatives – are forged. In a sense, the transition is already under way (cf. Hermans et al., 2010), with new business models forming an important backbone. However, the way forward is still a matter of great uncertainty and controversy: How do new business models relate to reconfiguring the Dutch agrifood system?

We explore the hypothesis that different transition pathways put specific demands on the role of new business models. We studied various new business models in the Dutch agrifood system and their relations to three different transition pathways. Our research combines future exploration (backcasting) and analysis of new business models.

In this research, we approach this question from two angles. First, we introduce a transition-oriented business model concept, in order to effectively link new business models to transition. Then we shortly touch upon the transition pathway typology introduced by Geels et al. (2016) and describe three different transition pathways for the Dutch agrifood system. We report on XX business models in each of these transition pathways. The paper ends with a discussion of the role of business models for different types of transition pathways.

Transformative agri-food business models

When do new business models lead to transition? Most business models can be seen as business-as-usual, as part of current regimes. For Dutch agriculture and horticulture, the dominant model consists of cost-price efficiency-driven businesses that produce good quality commodities for international markets. Social and environmental effects are seen as prerequisites rather than part of the value of the product. In recent years, however, more and more scholarly attention is directed towards the development of new business models (Jonker, 2014), sustainable business models (Schaltegger, Hansen, & Lüdeke-Freund, 2016), sufficiency-driven business models (Bocken & Short, 2016), et cetera – in short: business models that might contribute to transition rather than regime optimalisation. What are the conceptual ramifications of this development?

The term “business model” has at least three different meanings. As an *ontology*, a business model is a list of aspects and relations that together constitute a business (Osterwalder, 2004; Osterwalder & Pigneur, 2013; cf. Upward & Jones, 2016). The most famous example of this is the business model ontology by Osterwalder, which forms the basis of the business model canvas. In the form of a *practical operationalisation*, it describes how a (group of) actors together produce products and

services that, when transferred to a consumer, provide the consumer with various values, and the producers with a financial return (Boons & Lüdeke-Freund, 2013). It is a description of how a company or companies are able to make money by supplying products and services. Finally, as an *instrument*, a business model is a tool that can be applied to existing companies, to analyse companies or design new business models.

The Osterwalder canvas model (Osterwalder & Peigneur, 2013) is probably the most popular way to describe business models in business theory literature. At its core, there are nine coherent parts: 1) the value proposition, the bundle of products and services expressed in a price. This is offered through 2) relations and 3) channels to one or more 4) customers (or market segments). And this then leads to 5) income. There is also a business process that consists of a series of 6) core activities, using a few 7) resources, and in cooperation with a few 8) key parties. And all this brings with it 9) costs. There may be many more precise elaborations or variations on this model, but it can be justly claimed that, with these nine parts, it is definitely possible to explain a business model (Eppler & Hoffmann, 2012; Upward & Jones, 2016).

At the same time, the amount of criticism of the implementation of the business models in practice is increasing. We begin with three conceptual criticisms. Firstly, many scholars point out that value in terms of financial profit is seen as the most important success criterion (Bocken, Rana, & Short, 2015; Miller, Park, Evans, Bamford, & Bocken, 2016; Upward & Jones, 2016). This view of value is criticised because it does not include other considerations such as environmental and societal value (People-Planet-Profit, in other words, the triple bottom-line; cf. Ehrenfeld, 1997). Moreover, it only sees value as being something positive, whereas many businesses produce negative values (externalities), produce value for something for which they do not get paid, and value that cannot yet be monetised, but will be in the future (Bocken et al., 2015).

Secondly, various authors state that only a limited number of parties involved are taken into consideration, mainly the company, production partners/supply chain partners and the consumer. From a sustainability perspective, the environment, society and nature should also be included (Bocken et al., 2015; Upward & Jones, 2016).

Thirdly, business theory literature about business models gives little or no attention to the social and physical environment of the business model. The context is not given and, therefore, is as it were implicitly treated as being constant, stagnant (cf. Upward & Jones, 2016). However, from a transition point of view, the context is continuously moving: changing laws and regulations; changing public opinion; emerging new practices and movements, such as local-for-local, foodies. And a context in movement is constantly offering new opportunities and obstacles.

A second set of criticisms concerns the business model canvas as a tool to design new business models. Research about the use of Osterwalder's business model canvas points out that the results with the canvas model are seen by users as being less creative than simply using an empty PowerPoint slide (Eppler & Hoffmann, 2012). Various researchers (Eppler & Hoffmann, 2012; Miller et al., 2016, June) question a number of categories in the business model canvas, and suggest that the canvas is already so complicated to work with that this is at the expense of the result (cf. cognitive overloading, Beers, Boshuizen, Kirschner, Gijselaers, & Westendorp, 2008; cf. overscripting, Dillenbourg, 2002). Upward and Jones (2016) finally concluded that the business-as-usual nature of the business model canvas, together with its popularity, in fact even pose a risk to sustainability.

These collective criticisms suggest that, in the context of transitions, the business model canvas has several shortcomings. Furthermore, extending the business model to alleviate these shortcomings would probably result in severe limitations to its practical usability, given the current cognitive

demands of using the model in practice. Drawing upon these criticisms, we identify some goals for a transition-oriented business model concept. Firstly, as a transition implies a structural change, this means that the context for the business models involved will change in an important and possibly influential way. A business model concept should include changing discourses (e.g. increasing criticism regarding intensive livestock farming), institutional change (e.g. the Paris Agreement), new practices (e.g., in the case of agriculture, home delivery), and changing relationships with relevant stakeholders are changing (e.g. greenhouse cultivators talking to Greenpeace about climate issues). In other words, the business model should be reflexive (cf. Beck, Bonss, & Lau, 2003; Hendriks & Grin, 2007; Beers & Van Mierlo, 2017).

Regarding value, it is necessary to have a broader orientation with respect to value, not only the value that can be described using monetary terms today, but also how that value will change in the future, in terms of value for people and plant, and both positive and negative value. Furthermore, transitions concern functional and/or geographical systems, where ecological and social developments are an inherent aspect. In terms of value, this means that the value is not only economic and positive, but it may also be negative, and social or ecological.

As a first step towards a *transformative business model*, we build on a simplified business model canvas and include a reflexive orientation (see Figure 1). The core of the business model is captured by four aspects:

- *Value:* What are the different types of value (people, planet, profit) supplied by the business model, and to whom?
- *Products / services:* In which products/services is this value evident (including the production process)?
- *Production and chain:* How can I create the product/service and deliver it to the client/consumer (including key parties/partners)?
- *Valuation*: What do I get back for the added value I provide, and how?

We add a reflexive orientation by drawing on Beers and Van Mierlo's operationalisation of reflexivity (2017):

- *Discourses:* The changing way of thinking in society, for example when it comes to animal welfare, climate change, health care, mobility, et cetera, that can represent opportunities and threats for a business model.
- *Relations*: The changing possible relationships with societal actors that can offer opportunities and threats in the form of new clients, new stakeholders and new co-producers.
- *Practices*: Upcoming and disappearing practices that could create possibilities and limitations for new business models, such as with respect to logistics (home delivery) the 'maker' movement (the citizen creates more and more themselves), information and communication technology (production and supply chains are becoming more transparent) and energy supply (more and more citizens and farmers are producing and selling their own energy).
- *Institutions:* Changes in laws and regulations that lead to changing access to the market. For example, the Dutch supermarkets that no longer sell battery eggs.

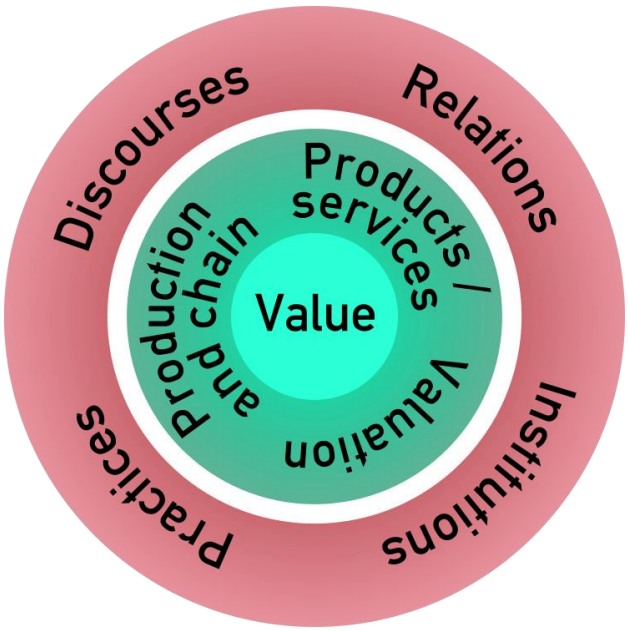

Figure 1: Transformative business model concept

Transition pathways

Geels et al. (2016) distinguish between four different types of transition pathways, which differ in the roles of institutions, actors and technologies. In the *substitution* pathway, transition comes about through new entrants that substitute incumbent firms with new technologies. This process is accommodated by limited institutional change, with some additional support for emerging niches. In the *transformation pathway*, the transition is mainly carried by incumbent actors, with limited (improving dominant technologies) to radical technological (technological substitution) and institutional change. In the *reconfiguration* pathway, transition is carried by new alliances between new entrants and incumbents, and associated new combinations of technologies. Institutional change may be limited but can include legislation about operations. The *de-alignment and re-alignment* pathway is the most disruptive one, occurring when a regime collapses while alternatives have developed only to a limited extent. In the period that follows, a new regime forms around new actors and technologies, with associated disruption of institutions.

This pathway typology was illustrated by examples from historical research. In our research, we focus on transition in the making. For the Dutch agri-food system, it is, as of yet, not clear what direction and depth future development will have, despite the fact that the agri-food system has given rise to a host of innovative agri-food practices. So, instead of doing an historical analysis, we produced three scenarios for Dutch agri-food transition, based on back-casting exercises in meetings with a broad range of actors from business, higher education, NGOs and lobbying organisations, and governments (cf. Loorbach & Rotmans, 20016; Rotmans & Loorbach, 2009).

Reconfiguration: Added value in and with the countryside

The first scenario, “Added value in and with the countryside” represents a reconfiguration pathway. In this scenario, consumers are increasingly critical about food origins and production. This provides opportunities for entrepreneurs – current farmers and new entrants in logistics and sales – to create added value by sharing their story about their societally responsive production methods and locations. This scenario features relatively small and extensive production of an exclusive product for a demanding consumer. For example, local production (local-for-local), short supply chains, sales using alternative channels such as the internet or pickup points nearby, and more

extensive production methods with extra attention to soil, biodiversity and animal welfare. The consumer knows more about the production method, the product and origins, and that their purchase contributes to the local economy. Farmers often combine agricultural production with healthcare or recreation.

Associated new businesses focus on ways of farming and cultivating that strengthen the connection between consumer, food and countryside: Where does my food come from? How is it produced? For example, meat products that contribute to maintaining the diversity of species of farm animals; local products that are not only food, but also culture; and production methods that pay extra attention to the animal and nature. The extra added value in these types of business models, compared to the conventional set-up, is provided in various ways: transparency about the origin and production methods; connecting the region with the countryside; and the added value for nature and the countryside, to name but a few. And, in some cases, a section of the city where urban agriculture is able to provide a kind of '*countryside'* function. It is often about small product flows.

Substitution: New products, specific markets

The second scenario, "New products, specific markets," concerns new technological opportunities for high-value products. It can be seen as a substitution pathway, especially from a market perspective. Technological developments enable new business to move away from the Dutch dominant model of cost leadership with commodities towards producing high-tech, high-value specialties for specific markets, such as salt-tolerant vegetables, meat substitutes and vegetables with exceptional nutritional content. Developments such as climate change, scarcity of raw materials and increasing population levels are generating a demand for products that can change in line with these developments. Technological developments are making new products or cross-overs possible. And this is making it possible to serve specific markets with targeted added value propositions, instead of creating a traditional product for the entire society.

In the transition path of new products and specific markets, it is often about new crops and/or technological adaptations to existing products. For products, examples include saline crops and insects, creating value from waste flows and the extracting components, both for food and for other industries (chemical and medical). And also, the production of high-grade proteins from plant-based sources. The characteristics these business models have in common are that they all use relatively new production technology that is not yet commonplace in the sector today, and that each business model is based on new products for specific markets.

Transformation: Sustainable production methods

The third scenario, "Sustainable production methods," combines technological innovations and societal values by drastically reducing odour pollution, preventing mineral emissions altogether, cutting back antibiotics use and using only renewable sources of energy, while improving animal welfare (transformation pathway). Associated new business models are traditional in the sense that they are mainly based on existing products. The main difference is that, thanks to technological innovations, they represent a major step towards sustainability.

The latest developments in both intensive and non-intensive livestock farming are making it possible to drastically reduce odour pollution and to almost prevent mineral emissions altogether. Also, the use of antibiotics has been drastically cut back and the attention paid to animal welfare has in the meantime increased (compared to traditional common practice). And more and more farmers are generating their own electricity and/or heat.

We are seeing similar developments in greenhouse horticulture. The use of herbicides, pesticides and insecticides has been dramatically reduced (especially in the cultivation of fruit and vegetables). This is partially as a result of the successes arising from organic agriculture, as well as recent developments in cultivation techniques (Next Generation Growing) and new greenhouse concepts (daylight greenhouse, ID greenhouse). These developments are making it easier to grow products without CO_2 emissions from fossil fuels (for example by using geothermal heat, heat pumps, ground water and residual heat).

Methods

We studied free novel agri-food business cases, food forests, green urban solutions, and climate-neutral greenhouse production, as business exemplars for each of the future scenarios. For each business case, we conducted a series of interviews with entrepreneurs and associated stakeholders in the business models. Interview data were either fully transcribed (in the Food forest case) or summarised and offered for correction to the interviewee (in the other cases). We then conducted a qualitative analysis using the eight categories of the transformative business model as analytical categories. For each category, we identified from the data every structurally different way in which it conceptually applied.

Results

We analysed three business models in detail, one for each scenario (see Table 1).

Scenario	Business model
Added value in and with the countryside	Food Forests
New products, specific markets	Green Urban Solutions
Sustainable production methods	Climate-neutral greenhouse production

Table 1: Scenarios and business models

Added value in and with the countryside: Food forests

Permaculture is an agricultural method that aims to produce agriculture products in a system that closely mimics natural ecosystems. The resulting agricultural production systems include up to seven layers of very diverse, mostly perennial production. Cited benefits compared to conventional agriculture include high system resilience, low to non-existent requirements for pesticides, and a very long production season. One common term for / form of permaculture is the food forest. In our study, we encountered to main types of food forests business models:

- A business model that combines production values and social values (e.g., care farming, social entrepreneurship, education, recreation, ...). Incomes is generated more or less evenly from both production and social activities, with additional support from subsidies.
- A production-oriented business model, which predominantly generates income from selling produce. This business model can still be combined with social services, but these only constitute a minor source of income.

Food forest produce has several dominant values, concerning product quality (e.g., being residue-free, transparency about production means, product uniqueness), environmental values such as

carbon sequestration, biodiversity, soil structure / water retention, and social value produced through education activities, recreation activities, and consumer involvement.

Food forest products and services are many and varied, according to the food forest farmer's tastes and preferences. All food forests included in our research produced various fruits and vegetables, up to 400 varieties per food forest. Some food forests also include services such as home delivery, pick-up at the food forest, and preparing meals.

In terms of production systems, the food forests we studied varied a lot. Starting a new food forest takes an initial investment for land and plants, which will take a year up to decades before they start giving a yield. Input costs diminish over time and after about ten years, as the food forest increases its production and matures, it becomes self-sufficient. The production systems share various functions, that each require specific vegetation, such as nitrogen fixation, pest control, unique products (taste, rarity) and cash crop. Customers include restaurants and specialty stores as well as individual consumers.

Revenue streams differed a lot between food forests. Interestingly, our interviewees were largely unable to specify production-associated income estimates. Other revenue streams included subsidies for ecosystem services and revenue from social activities (such as education and recreation).

Our interviewees see food forests as fitting with an increasing societal awareness of the relations between food and sustainability, among specific consumers looking for "responsible produce". This translates into consumer loyalty towards permaculture principles and trust in the food forest farmers. Another emerging discourse concerns the circular economy. While vague, the interviewees see food forests as a very circular example of food production.

When looking for connections with consumers, the rise of online sales in many different sectors is a promising practice for permaculture businesses, allowing channels of sales to specific consumer groups that are hard to reach otherwise. Other new relations include governments, who, currently in The Netherlands, are trying to support food forests, and conventional farmers, who may be interested in experimenting with a couple of hectares for food forests.

In terms of institutions, some interviewees detect a rising government interest in agro-ecological initiatives and shifting responsibilities for land stewardship more towards the entrepreneurs. That might result in legislation that would be more favourable to food forest production than to conventional production.

Relating the food forest business model to the scenario, several characteristics stand out: relatively small and extensive production of exclusive, localised produce for demanding consumers, combined with social / educational functions and some subsidies. In contrast to conventional agriculture, uniqueness, diversity, multifunctionality and transparency appear to be key selling points. Furthermore, these core values are currently interesting for a small group of highly aware consumers. For a transition to take place, this would either require a widespread increase in consumer awareness (unlikely) or some kind of market protection, since food imports do not need to conform to the same high standards as food forest produce and will likely be cheaper, and therefore more attractive for the average consumer.

A related challenge, for the scenario, resides in the reconfiguration of production systems themselves. The assumption would be that current conventional producers, together with new entrants, would switch to more extensive, local-for-local production systems, of which the food forest is one example. However, given the current small market perspective, no basis exists for a scaling out of such production systems. Further institutional arrangements could provide stronger

market incentives. One of these might reside in the formation of 'food co-operatives' of citizens and farmers to ensure adherence to certain production methods and adequate supply and remuneration. Furthermore, this pathway implies a drastic change in diets, since a Dutch localised production would mean eating seasonal produce instead of luxury goods from all over the world, all year long. Finally, logistical networks need to be more fine grained and points of sale more diversified. In sum, it would appear that the reconfiguration scenario in our study may be able to use existing business models that are already successful in niche markets, such as food forests. However, for these business models to results in transition, it would require logistical reconfiguration too, new diets, new institutional arrangements between producers and consumers and some kind of market protection for more "agro-ecological" production systems.

New products, specific markets: Green urban solutions

We conducted an exploratory study of various entrepreneurs and associated stakeholders in the field traditionally associated with tree nursery and gardening – basically the production of plants for decorative uses in the city. Recently, however, we see the emergence of more functional, specific, and high-value uses of "green in the city", which we have named green urban solutions:

- Plants for urban farming / urban agriculture
- Green roofs and green façades
- Green interiors / living walls

In all these cases, there is a move from generic products with decorative uses to specific products with specific uses.

Green urban solutions, depending on their specific form, can serve a whole range of values, including purely environmental, purely production, and economic values (see Table 2 for an overview). For example, urban farming is associated with production value, but is also suggested to be valuable for mental health and recovery from illness. Furthermore, participating in the maintenance of urban gardens also has social advantages, is said to contribute to social cohesion within neighbourhoods.

Type	Values
Plants for urban farming / urban agriculture	Nutrition, mental health, social cohesion, biodiversity, water retention / flood prevention, knowledge about food / education, liveability
Green roofs and green façades	Water retention, heat reduction / mitigation of heat stress, decoration, liveability, insulation, roof durability
Green interiors / living walls	Liveability, worker productivity, consumer behaviour

Table 2: Types of green urban solutions and their values

The products and services offered go beyond the plants themselves, but now include societal functions and the services needed to keep providing those functions, such as gardening and design. From the plant nursery perspective, this is not a big role change, but the partners involved in producing green urban solutions are more varied now. When it comes to urban agriculture, for

example, production is often carried out by volunteer-participants. When it comes to green roofs and façades, green interiors and living walls, architects play an important role now. Table 3 shows a list of functions and associated production partners of green urban solutions.

Function	Partners
Care: health care, physical rehabilitation	Primary and ambulatory health care institutions, hospitals
Social cohesion: participation of disadvantaged groups	Municipalities
Recreation: food and drinks	Bars, restaurants, food services
Education	Schools
Shopping	Livability, worker productivity, consumer behaviour

Table 3: Functions of green urban solutions and associated partners

In terms of generating revenue, this functional breadth poses problems. The initiatives that we studied generated income from government actors (including some subsidies) and from private partners (project developers). The presence of green urban solutions then, in turn has added value for "users" such as care providers and restaurants. However, they do not pay directly for the presence of green urban solutions, they only indirectly factor in, as an advantage to a specific location. A challenge resides in generating income from end users.

Several emerging discourses align pretty well with aspects of green urban solutions. Regarding food, more and more people seem to appreciate full disclosure about where their food is from and how it is produced. Urban farming is an excellent example of how such disclosure can be provided. Similarly, the emerging societal discourse about climate change was mentioned as important for functions such as heat stress reduction and water retention.

Promising relation might be possible with health insurance companies and municipalities. These are both powerful actors that might benefit from green urban solutions on a more aggregate level.

In terms of institutions, it would be especially beneficial if methods were to develop that enable pricing the value of green urban solutions. Some such experiments were mentioned by the interviewees, but, given the difficulty of generating revenue from end users, more such methods could be promising for further upscaling of green urban solutions.

Finally, the development of green urban solutions seems to coincide with the emergence of bottom-up initiatives and societal participation, which might provide opportunities for their further development.

Relating to our scenario, the first aspect of the green urban solutions that stands out is that it is not an agrifood example, but only agriculture. However, for the purposes of our analysis, perhaps it is more important that the associated products and services are fundamentally different from the

traditional arboriculture products that they substitute: the green urban solutions offer more value and are more knowledge intensive. This suggests that they belong to a different market – the system changes from a market based on commodities and cost-price leadership to a market based on quality high-end products and high margins. It may be the case that these changes will cater to different consumers too. New markets need to emerge that connect new consumers with these products. Interestingly, all these changes occur mainly on the production side. In other senses, they do not require so much system reconfiguration, apart from logistics focused on specialties instead of commodities.

Sustainable production methods: Climate-neutral greenhouse production

The Dutch greenhouse sector is responsible for about ten percent of the Dutch yearly natural gas consumption, mainly to heat the greenhouses. Many entrepreneurs are looking to reduce their energy consumption and so increase their cost-efficiency. The more radical option, however, is to move away from gas completely, and exchange it for geothermal heat combined with specific greenhouse innovations and new production methods that require less heat. Hence the contours of a new businessmodel: climate-neutral greenhouse production.

The main value proposition of climate-neutral greenhouse consumption, compared to conventional agriculture, resides in its relative advantage with regard to CO_2 emissions. Other business values are inherent in the products, such as taste and size, and do not differ from conventional produce. In other words, the climate-neutral greenhouse does not provide specific products or services. In that sense this business model is comparable to organic production, which requires certification of a production method in order to be distinguishable from conventional produce.

Changing to a climate-neutral business requires substantial investments in energy provision, such as installing geothermal heat and/or the use of heat pumps and heat exchangers in combination with seasonal storage in aquifers. Furthermore, some interviewees state that they use specific, innovative greenhouse designs. However, most interviewees still saw these investments as investing in energy efficiency, not in terms of a new business model. Some do you use a label (“Grown with geothermal heat). Sales organisations are enthusiastic, but this label rarely reaches the end consumer, suggesting that traders only focus on security of supply, product quality and safety. In that sense, the question remains whether one may speak of a business model if the end product cannot be bought as such by the consumer. It also means that climate-neutral greenhouse production has no specific valuation method.

For our interviewees, the main value proposition of climate-neutral greenhouse production is well-aligned with the emerging societal discourse about climate change and energy transition. Indeed, one mentioned that climate-neutral production is not an end, but a means to reconnect to society. Climate-neutral production is also seen as related to corporate social responsibility.

Some of our interviewees have taken steps to connect with new, unusual actors such as Greenpeace, to strengthen their position. Other actors, however, appear rather problematic. Concerning the role of the government, interviewees note that it is easier for conventional businesses to acquire building permits, because policy offers are better acquinted with the conventional. Interviewees hope that banks and lobbying organisations will support climate-neutral greenhouse production, but this was not yet the case at the time we performed our interviews (2016).

In terms of institutions, interviewees have the impression that Dutch rules and regulations favour conventional greenhouse growers. The energy taxation system is ‘defensive’, that is, tax costs level off with higher consumption, which makes it harder to derive a competitive advantage from

investments in one's energy system. Furthermore, no mechanisms currently exist that would result in a higher price for produce with a big climate impact, meaning that the climate neutral producer does not have a market advantage in that regard either.

New practices include the sourcing of sustainable CO_2 as fertiliser for the plants. Currently, many Dutch growers take CO_2 from their combined heat-and-power installations. Climate neutral growers do not have this source available and need to look elsewhere for CO_2.

The business model of climate-neutral greenhouse production fits very well with the transformation scenario. It concerns changes among the incumbents to take into account some sustainability aspects, but does not require new entrants. The products stand out, not because they differ from the conventional, but because they are the same. From a business model perspective, this is especially problematic, because it makes it hard to stand out in the market, while the new modes of production do require investments in production infrastructure. Clearly, such a transition requires legislation that at some points come to enforce the necessary changes. Up until that point, opportunities may exist for new business models based in improved production methods. However, the example that we studied actually shows how hard it is to base a new business model only on added value that is produced during production, and not apparent in the product itself.

In sum – our reconfiguration scenario leads to radically different environmental business value. However, despite some adoption of these technologies, few existing agribusiness have reoriented their underlying business model. For the agri-food system, this actually means very little reconfiguration in terms of food culture and practice. It does require legislation and finances that forces agribusiness to change, but diets and logistical systems can remain largely the same.

Discussion

In this paper, we explored three future scenarios that each exemplified a specific type of transition pathway. Next, for each scenario we studied a business model that might act as a carrier for transition. In this section, we gather hypotheses about the role of new business models in different transition pathways, based on our analyses.

First – the scenarios clearly differ in the kind of transition pathway that they represent as well as the role of new business models. The first, reconfiguration scenario – added value in and with the countryside – appears most far reaching in terms of systemic reconfiguration, requiring changed logistics, food chains, modes of production, diets, and institutional change. However, associated businesses are already successful for a specific consumer group. Innovative entrepreneurs have already shown that they are able to earn a living in their specific niches. The challenge resides in scaling up, since that would require market access to conventional consumers that not share the same level of awareness and preferences as the current consumers. For them, the products should be at least as good as conventional products, and cheaper as well. So, while the business models exist, the challenges for transition are far reaching.

The substitution scenario clearly requires new markets. Again, producers have already shown that they are able to successfully produce for these markets. However, the example of green urban solutions also shows that those markets still need to develop. Who benefits most from new products? And who is the end consumer that pays for them?

The transformation scenario seems the most straightforward in terms of business models. Although are example has not been successful yet from a marketing point of view, the transformative businesses in this case can use the same logistical channels as the conventional producers, since the end product is mostly the same as the current commodities. Perhaps the essential driver in this

scenario would be institutional change that enforces certain production methods, while it might be harder for producers to actually derive a business model from specific production methods. In sunm – our results lend credence to the hypothesis that different transition pathways offer specific potential for and requirements of new business models.

The current study has shortcomings in the sense that it only included three different business models. In that sense our conclusions are limited to the hypothetical. In future research, we hope to add more business model analyses to our research, to be able to learn more about the role of new business models in different types of scenarios.

With regard to new business models, we opted to introduce a new concept for transformative business, based on the canvas business model but with some simplifications to make it more useful and some additions to make it better fit with transitions. Our analyses suggest that the eight categories in the transformative business model concept are applicable to three very different business models. Furthermore, the categories of discourses, relations, institutions and practices appear important to relate these business models to transition scenarios, which would suggest that the transformative business model concept might be useful for entrepreneurs that hope to contribute to transition. In turn, we hope that our work contributes to the success of these entrepreneurs.

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