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Review

Energy cropping and social licence: What's trust got to do with it?

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ABSTRACT

Cellulosic energy crops have been promoted in various jurisdictions for their potential to mitigate climate change and enhance energy security while avoiding some of the negative impacts associated with first-generation biofuel crops. However, the successful expansion of cellulosic energy cropping depends on its acceptance by local communities. The social licence to operate (SLO) concept has been applied in mining and other sectors since the late 1990s and offers a framework for analysing the relationships between energy cropping proponents and local communities.

This review analyses recent cellulosic energy cropping studies to determine the extent to which they consider the key SLO variables of distributional fairness, procedural fairness, trust and adaptability. The results indicate that, of these four variables, trust has received the least coverage in previous studies focusing on the social dimensions of cellulosic energy cropping. This review also highlights a contrast between energy cropping studies that applied the SLO concept, all of which explicitly considered trust, and those studies that did not apply the SLO concept. This result highlights the potential role that the SLO concept could play in ensuring that the importance of trust is not overlooked by researchers, bioenergy proponents or policy-makers.

1. Introduction

Cellulosic energy crops are increasingly being established and promoted as a new land use option across the world, including through supportive policy mechanisms such as the EU's Renewable Energy Directive (RED) and US Federal Government's Renewable Fuel Standard (RFS). The arguments made by the European Union [18] for promoting woody energy crops relative to first-generation fuels include their potential to deliver higher yields and greater life-cycle greenhouse gas savings while reducing risks related to competition with food production, deforestation and indirect land use change. Some types of cellulosic energy crops have also been associated with positive effects on ecosystem health, such as soil remediation and habitat provision from willow and poplar crops in Europe [11], mitigation of dryland salinity and enhanced nutrient cycling from mallee eucalypts in Australia [3,5] and increased soil carbon from switchgrass in the US [33]. However, fulfilling this potential depends on the acceptance of cellulosic energy crops by affected local communities.

The concept of a "social licence to operate" (SLO) provides a way of both conceptualising and strategically building community acceptance or approval of new activities or practices that goes beyond the requirements of formal regulatory processes. SLO definitions vary, but commonly focus on the notion of ongoing acceptance or approval of an operation, project or activity from the affected local community and other stakeholders (e.g. Refs. [28,37,39,60]). Failure to obtain a SLO can lead to significant costs to industry [21], stricter regulatory restrictions on future developments [24] or the closure of operations [20].

The SLO concept has been applied most widely in the mining sector, where it is commonly cited as having emerged in the late 1990s (e.g. Refs. [21,48]). However, Edwards et al. [14] provide evidence that it may have been first used slightly earlier in the forestry industry and it has since been applied to a diverse range of activities including wind farms [25], cotton farming [53] and the creation of protected areas [61]. While bioenergy is a relatively new area for the application of the SLO concept, recent examples include the development of bioenergy facilities in India [17], the use of forest biomass for energy in Sweden [15] and the cultivation of woody energy crops in Australia [62].

As the SLO concept becomes more prominent in the bioenergy sector, there is an opportunity to learn from experiences in other sectors such as mining and forestry. This in turn may help to reduce the risk of social conflict and ensure the long-term success of cellulosic energy crop expansion. To contribute to this learning, this article presents:

- a review of the key variables that determine SLO, as identified by previous studies in other sectors, including mining, forestry and wind energy;
- analysis of the extent to which these SLO variables have been considered in studies exploring the expansion of cellulosic energy crops; and

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- discussion of the potential value of the SLO concept for future research into cellulosic energy cropping.

2. What is a social licence to operate?

The social licence to operate (SLO) concept is based on an analogy with a formal regulatory licence, evoking the idea of an approval process that must be followed, a set of conditions that must be met and a degree of certainty that is provided to an activity's proponent [19]. However, unlike a regulatory licence, a SLO is informal and intangible, is issued by a local community rather than a government agency and may be gained or lost through complex processes with high levels of uncertainty. Furthermore, while the establishment of a SLO may be a necessary condition for a project to proceed smoothly, a SLO also requires active maintenance over time. Thomson and Boutilier [60] highlight that, despite some attempts to define SLO as something more permanent, SLO is "dynamic and nonpermanent because beliefs, opinions, and perceptions are subject to change as new information is acquired" (p. 1779).

While there is a high degree of overlap between SLO and the broader concept of social acceptability [19], SLO is characterised by the licence metaphor and the type of relationship it involves, which is typically between a business and a local community. In contrast, social acceptability may be applied to government policy as well to businesses [19]. Social acceptability may also be applied at larger geographic scales [64], with local-scale "community acceptance" one of three key elements alongside broader-scale "socio-political acceptance" and "market acceptance".

The focus on local communities has been a central element of SLO since its earliest conceptualizations, with Joyce and Thomson [28] arguing that SLO "must begin with, and be firmly grounded in, the social acceptance of the resource development by local communities" (p. 52). The primacy of the local scale has undergone some challenges in recent years through a shift towards greater consideration of SLO at larger geographic scales [39]. For example, the term social licence has featured in national political debates in Australia around banking [46] and greyhound racing [37]. However, most SLO definitions and frameworks in the academic literature echo Joyce & Thomson's arguments regarding the primacy of local stakeholders (e.g. Refs. [40,48,60]). For cellulosic energy crops to expand in a socially sustainable manner, it is essential to consider the effects on local stakeholders and not simply benefits that might occur at the global or national scales, such as climate change mitigation or national energy security.

One of the defining features of the SLO concept is its non-linear conceptualization of the way in which local communities respond to new land use activities. Under the SLO concept, social acceptance is not defined in linear terms such as "low" or high", but according to different states of acceptance separated by thresholds. This focus on states, thresholds and non-linear change connects the SLO concept to systems thinking, as demonstrated previously by Prno and Slocombe [48]. Systems thinking is based on the idea that determinist and reductionist approaches are unable to fully explain the processes operating in complex adaptive systems that are characterised by pervasive uncertainty, non-linear change, emergent properties and self-organisation [26,38].

Fig. 1 provides a simple illustration of how a new land use activity such as energy cropping could move between different states in which a SLO is either held or lost, based on the analogy of a "ball in a basin".

Prno and Slocombe [48] define four possible SLO states for mining activities: (1) SLO issued, mining proceeds, (2) SLO not issued, mining proceeds, (3) SLO issued, mining doesn't proceed, and (4) SLO not issued, mining doesn't proceed. Thomson and Boutilier [60] take a different approach and define SLO states based on how strongly a SLO is held. Their first SLO state is "acceptance" (community tolerates the activity), followed by "approval" (community favourable to or pleased with activity) and finally "co-ownership" (community takes on the activity as part of its collective identity and becomes emotionally invested in its future). They also label the critical thresholds that must be crossed in order to reach each state, namely the "legitimacy boundary" (to reach acceptance), the "credibility boundary" (to reach approval) and the "full trust boundary" (to reach co-ownership).

A final point to emphasise is that the SLO concept is not the only social analysis approach that considers thresholds and non-linear change. For example, Wüstenhagen et al. [64] present the idea that a "critical mass" of socio-political acceptance may be required to deliver widespread change and Ford and Williams [19] discuss the "domino effect" by which cascading negative outcomes for local communities can lead to a rapid decline in acceptance of plantation forestry. Both articles employ a social acceptance rather than SLO framework. Thus, SLO is only one approach that sits within a broader field of study around social acceptability and may overlap with other frameworks.

3. Determinants of SLO: insights from other sectors

While there are relatively few studies that have applied the SLO concept to energy cropping, it has been more widely applied in other sectors, particularly mining. Many SLO studies focus on specific local case studies, but there have also been a number of attempts to develop generalised SLO frameworks that outline the key variables determining whether a SLO is gained or lost. Table 1 presents five such frameworks, including three related to mining, one for forestry and one for wind energy.

From the large number of mining studies on SLO, Thomson and Boutilier [60] has been selected for inclusion in Table 1 due to its high citation frequency and connection to early SLO work (e.g. Ref. [28]). The framework of Zhang et al. [66] has been selected for its simplicity and connection to other SLO studies (e.g. Refs. [30,39,40]) and that of Prno [47] for its innovative use of systems thinking (also reiterated in Ref. [48]). The frameworks presented for forestry [10] and wind energy [25] have been included due to links between these activities and energy cropping (i.e. producing biomass and supplying renewable energy respectively). First-generation biofuels are another sector that has relevance for cellulosic energy cropping, but studies on SLO in this sector [49,56] do not present generalised frameworks that are comparable to those shown in Table 1.

There is a high degree of overlap between the key variables covered by the five frameworks shown in Table 1. However, they differ in terms of the structure they impose across these variables. Zhang et al. [66] use trust as an over-arching determinant of social licence, with distributional fairness, procedural fairness and confidence in governance all contributing to trust-building. In the other frameworks, trust is not given this central role, instead representing one key variable alongside others. Some of the frameworks also differentiate between obtaining and maintaining a SLO. This is most notable in Prno and Slocombe's framework , which focuses on building a resilient SLO, whereby "widespread community approval is maintained … even amid crisis events and other stresses on the company-community relationship" [48] p. 679). As such, Table 1 highlights not only the variables that are linked to the initial establishment of a SLO, but also those that have been specifically linked to SLO maintenance or resilience.

For the purposes of this review, four key SLO variables have been selected for application to cellulosic energy cropping, based on the five studies in Table 1. These are (in no particular order):

1. Distributional fairness (i.e. how different stakeholders are affected by positive and negative impacts of an activity)
2. Procedural fairness (i.e. processes for communication, governance and stakeholder engagement/participation)
3. Trust (including the associated concepts of credibility and legitimacy)
4. Adaptability (including associated concepts such as flexibility and responsiveness)