**Driver Pack from Bioeconomy workshop 15th December 2016**

**5 BIGGEST DRIVERS**

* **Social** – Engagement and Understanding (messaging, consumers, education systems, social spectrum)
* **Technological –** Technology Library – codifying understanding and access to the best technologies
* **Environmental –** Climate Change and everything it brings – lots of uncertainty
* **Economic –** Price of raw materials
* **Political –** Global Policy uncertainty is high e.g. globalisation vs trade wars

**Interesting drivers to look at**

**STEEP Analysis – Drivers not going forward** (not all of these will make sense and are to be used as a contextual aid for the overall piece) Where votes were placed these will be recorded to show popularity of the concept. There were 130 drivers in total.

**Society**

* Understanding and engagement – 11 votes
* Money – 1 vote
* Consumerism – 1 vote
* How to engage with the broader society – outwith experts
* Achieving public buyin – affordability and social mobility as part of the answer
* Fragmentation of society
* Very different priorities across groups
* Need local enablers rather than the ‘big picture’
* Inequality and poverty
* Communication
* Scotland needs extra resources directed towards the bioeconomy
* Splintering of political groups – probably resulting in a ‘strong man’ (trump, farage, putin etc)
* A significant reduction in food imports would drive self sufficiency and increase bioeconomy
* Expertise! – no idea
* WAR!
* Flooding drives – land use change and migration
* Total change in agroeconomy
* More spending on defence and security
* Scotland seen as a haven – inwards migration
* Public trust in organisations is variable
* Stop talking about waste, start talking about economically valuable outputs
* Bioeconomy needs to be in teaching and classes to lead to next generation of workers
* Messaging needs to be correct to get uptake across society
* Cost and quality of products will be key
* Affordability 🡪 consumer 🡪 industry 🡪 poverty
* Education is required
* Confusion on waste collection no consistency of messaging across Scotland
* How much does culture influence choice or just class?

**Technology**

* Where are we with mapping – 0 votes
* Scale of economy – can bioeconomy work at scale of Scotland? – 3 votes
* Access to technology – how do we match technology and need? – 1 vote
* Need for a technology library for companies to know what is available – SE option?
* Need to know about the supply chain of pre-processing companies
* Need to look at resource handling systems
* Infrastructure map of processing
* Need for catalyst in this area – lab, scale, demonstrator, commercialisation
* Translation issues between academia and industry
* Gap in capacity between lab and pilot – Business need
* Need to tie CO2 and bioeconomy together
* Cost of development
* IP
* “clean” GMO e.g. Crispr/cas9
* Need to improve raw materials, using genome assessment of agricultural processes , this will reduce the end waste overall
* Can we have an app to link resources and processes
* Need to link the food – products – raw materials – waste cycles

**Economic**

* Price of Raw Materials – 6 votes
* Policy and Regulation framework – 4 votes
* Corporate decision making – 6 votes
* Innovation investment – 4 votes
* Need a report of resource mapping and technology mapping (ZWS?)
* Consumers not caring and disengaged in direction of travel – made worse by consumerism
* Commodity prices for heavy metals and phosphorous rise dramatically due to conflict 🡪 drives economics for waste products (e.g. sewage for phosphorous)
* Resource price increases will drive changes and uncertainty
* Increasing social awareness will drive in crease of ce opportunities leading to better economies of scale
* To sustain growth in GDP – use of materials must be decoupled
* Increasing demand for critical materials – will impact on smes ability to operate as normal
* Oil prices and volatility
* Increased international competition will lead to increased globalisation fewer large corps controlling resources and product policy
* Corporate intent to change is there +ve
* Must use waste to make food +ve
* World drought combined with Scottish independence 🡪 mass immigration
* Making ce models cost competitive e.g. lease not buy
* Commercial decision making influences how economies operate – BASF, Unilever, so how can we influence them?
* Increase protectionism by countries could result in reduced trade forcing increase utilisation of domestic resources
* Increasing cost of sorting waste
* Tax on increases to levels where high labour manufacture business goes bust 🡪 no jobs
* Growth in new emerging sectors e.g. organic wastes
* More oil i-ve
* Oil prices rises above $125 – biomass becomes more viable
* Virtual currency of bitcoin use for trading goods reduced government control of currency value
* There will be high demand for cheaper raw materials and materials through urban mining
* Policy framework to inform investment
* Regulatory drivers – e.g. waste regs, landfill tax, organic ban to landfill
* Subsidies
* Enhancing collaboration & integration to improve cost efficiencies
* Regulation driving higher value use +ve
* High TRL investments needed
* Directed R&D funding
* Positive investment landscape
* Increasing innovation to extract high value from waste materials – RESEARCH PROJECT?
* Support for industrial innovation needed
* Few or limited financial support to encourage and assist bioeconomy projects here in Scotland that attract international corporations to FDI

**Environmental**

* Resources and material use – 7 votes
* Environmental quality – 5 votes
* Climate Change – 12 votes
* Locally sourced materials
* Capacity building amongst cafes, restaurants
* How do we change consumer behaviour
* Managing land use
* Fishing new species
* How do we3 manage land use in Scotland –ve grouse shooting
* Increasing global population – increase competition for bio resources
* Negative impacts of industrial agriculture on soil will have a negative impact on food production
* Air quality a factor in use of bioeconomy pm 2.5
* Need to improve soil
* CO2
* Rise in urban agriculture
* Food waste –ve impact on bioeconomy
* BIOECONOMY IS A CARBON SINK – LIKE THAT ONE
* Increasing urbanisation will have a negative impact on the rural economy, affecting the bio resources
* Community empowerment for action
* Energy oil based vs renewables – need to look at energy map
* Food-Energy-Water nexus challenge
* CCS versus bioresources
* Greater fluctuations in weather
* Water security becomes issue
* Nutrient degradation

**Political**

* Post-truth world 4 votes **THIS WAS THE CHOICE**
* Large global changes in policy 4 votes **THIS WAS THE CHOICE**
* Brexit uncertainty (inc financial landscape) – 5 votes **THIS WAS THE CHOICE**
* Business rules the world
* Short termism affecting the policy decision process
* Strength of the fossil fuel lobby in Scotland
* Economic importance of O&G industry in Scotland
* SME political beliefs
* Taxation versus Incentives
* Should there be a global carbon tax?
* Ability for fast political change in Scotland
* Increased government interaction in steering decisions
* Locally different political agendas
* Political uncedrtainty
* How to achieve poltical certainty in decision making
* Global companies do not invest in UK bioeconomy
* Stretched public finances – renewables cuts
* Not knowing which horse to back – 1 vote
* Inequality – 1 vote
* Increasing resource volatility – 3 votes
* Increased market volatility – 2 votes