Pitcher's Name	Saphira Rekker	**Purpose**	General Research Project: Sustainable Systems/Consumer Behaviour (A4)

(A) Working Title	Converting planetary boundaries into action: A new approach to meeting global greenhouse gas targets
(B) Basic Research Question	How can we use scientific planetary boundaries on greenhouse gas emissions as a tool to create guidelines for individuals to take action?
(C) Key paper(s)	Rockstrom, J., Steffen, W., Noone, K., Persson, A., Chapin, F. l., Lambin, E., et al. (2009). Planteary boundaries: exploring the safe operating space for humanity. Ecology and society , 14 (2).
(D) Motivation / Puzzle	Targets for global greenhouse gas emissions have been set by scientists, engineers and economists, to avoid the most severe consequences of climate change. However achieving these targets is a "wicked problem", i.e. a unique and complex problem, constantly changing, involving multiple stakeholders with conflicting interests and certitudes. Currently there is an essential link missing in the literature that translates theory into practice. While multiple schemes exist to engage industry and government, little recognition has been given to the role of individuals in reducing greenhouse gas emissions. Hence, there is a need for practical tools that help individuals to reduce emissions to a 'fair-share' level. Herewith, this project addresses the global challenge of greenhouse gas (GHG) emissions reduction from a completely new angle. It uses a bottom up approach, using economic theory and scientific data.
THREE	**Three** core aspects of any empirical research project i.e. the "IDioTs" guide
(E) Idea	This project addresses the global challenge of greenhouse gas (GHG) emissions reduction from a completely new angle. It uses a bottom up approach, using economic theory and scientific data. Ultimately the project develops a new tool to drive individuals to reduce GHG emissions associated with their consumption. Existing scientific knowledge is used to calculate individual quotas and lays the foundation of this research, currently missing in the literature. When this information is translated for individuals to use, it develops a practical solution to a complex problem, and thus filling a missing but essential piece to address this intractable global problem. By creating awareness about a range of actions that an individual could take-up, presenting the decision about what action to take as a game or app and linked to social networks/media, this research will develop an effective decision-support tool that could be commercialised. Also, the underlying model can be used to develop range of tools to fit different age groups and lifestyles.
(F) Data	- Use available data on GHG emissions of production and consumption, and calculate individual GHG emission quotas (based on global emission targets) using GHG emission accounting techniques. The global Trade Analysts Project Database provides per capita CO2 emissions of 8 different consumption categories for all countries. Prices of this database are $1080, should be able to get funding. Research by Rockstrom et al. (2009) provide calculations of global emission boundaries for our planet. - Ultimately the emissions per consumption category per capita would be calculated in a universal way, though as of yet this data varies per country, so as a starting point we would use Australian CO2 emissions per consumption category.

(G) Tools	An optimization model will be developed and applied to determine how the constraint of this individual quota can be met to reduce GHG emissions globally, given constraints and meaningful options for individuals. Economic modelling (including input---output techniques) and systems dynamics will be used to identify an (a most) optimal solution based on emission constraints. Development of software that utilizes the optimization model that can be 'played' by the individual according to his/her references, motivated by incentives and meeting the emission constraints. This final stage is constructed using economic theory (e.g. game theory) and psychology on consumer behaviour. The underlying model of the software, can be used to develop several applications to create a change in consumption behaviour.
TWO	**Two** key questions
(H) What's New?	The research will be distinctive in that carbon footprints of individuals are compared to scientifically determined limits to CO2 emissions. These limits outline how much we can emit if we want to keep living in a 'safe human operating space' - and live life as we know it. These scientific limits are only known recently and there is no research as of yet that translates these planetary limits into individual's consumption patterns and thus into how to take practical and effective action into meeting these targets (individuals being one of the multiple parties playing a role in meeting these targets). Economic theory and psychology on consumer behaviour provide insight on how to best design a practical tool to assist individual consumer's decision--making. This will be a software game or an 'app', possibly linked to social networks/media, that takes into account the individuals' planetary GHG constraints but honours the individuals' freedom of choice to meet this constraint. The tool will aid people to monitor and reduce their emissions, motivated by meeting constraints. It ultimately draws upon natural human behaviour, such as competitive or financial incentives, to make it attractive to a wide range of individuals including those unaware or sceptical of climate change.
(I) So What?	Urgent action should be taken if humans want to avoid the most severe consequences of climate change and individual's play a key role in meeting the CO2 limits set by scientists.
ONE	**One** bottom line
(J) Contribution?	Using an interdisciplinary approach to calculate individuals' GHG emission quotas and use economic theory and psychology on consumer behaviour to translate this into practical and effective action by individuals.
(K) Other Considerations	As it is very interdisciplinary, collaboration with experts in different fields is necessary. Knowledge needed of ecological processes (natural scientists), software development, programming, economic theory, and psychology. I have little knowledge of relevant journals. As it is interdisciplinary a wider range of journals might be interested. Probably journals in the natural sciences would be most interested.