

# Meat the Biggest Threat and Opportunity to Climate Change

Written by Mark Pershin, Founding Director of Less Meat Less Heat, July 2015

## Introduction

We have known about human-caused climate change for well over a century and have had in operation a global framework for dealing with it for well over two decades, yet we are still failing to stop or even slow down its advancement towards catastrophe. Climate scientists have been sounding the alarm for decades, and it seems like the more they learn the more horrific their predictions become. Historically the focus of the United Nations Framework Convention on Climate Change (UNFCCC) negotiations, as well as that of the overwhelming majority of environmental groups focused on this issue, has been on reducing greenhouse gas emissions from the combustion of fossil fuels for energy production and transport. However it does not appear that the question has been asked, 'is this enough?'

I have been asking myself this question ever since I got to tinker with a climate model during my postgraduate studies at the University of Melbourne. What I found during this modelling shocked me. Even if we stabilise fossil fuel emissions but fail to do so across other sectors of the economy, especially from agriculture, we will surpass the inadequate two degree target set by the world's governments and run into catastrophic climate change. There is rarely ever a silver-bullet solution to a complex problem and climate change is no exception. Hence conversations about actually avoiding the worst effects of climate change must begin at first principles. So let's do just that.

## A brief history of time

Although most of us are not climate scientists it does pay to have a basic understanding of the fundamentals of climate change and the greenhouse effect, for without the latter it is unlikely that our planet would be home to many living things, let alone intelligence. Simply-speaking, volcanoes helped form the atmosphere while living organisms have helped shape the atmosphere to their liking in two ways; firstly by warming the planet to a liveable temperature by producing methane and carbon dioxide during the process of decay of dead life matter, and secondly by creating oxygen through the process of photosynthesis by our green friends in the plant kingdom.

Then we came along around 200,000 years ago. We managed to avoid tampering with these mechanisms for the majority of our stay. That is, until we discovered fossil fuels and put them to use in fundamentally reshaping our society since the industrial revolution. This has allowed us to make some massive leaps forward in science, technology, medicine and transport just to name a few. However this came with great costs that are only now beginning to be realised. We have drastically changed the carbon cycle – the natural process that has allowed our climate to stay relatively unchanged since the dawn of agriculture approximately 10,000 years ago. We have done this by emitting far more greenhouse gases than our planet can absorb and thus allowed them to build up in the atmosphere, warming the planet over time.

## Let's talk about gases

Any conversation about climate change must start with a conversation about gases. The major types of gases we emit are carbon dioxide, methane and nitrous oxide. As your nose can attest not all

gases are the same, especially when it comes to how effective they are at trapping heat in our atmosphere and how long they last. The United Nations (UN) faced this very problem when creating the UNFCCC back in 1992. They decided to use the global warming potential (GWP) method, which measures the degree to which a gas warms the climate over a specific period of time, to solve this issue. The UN chose 100 years as this time period, an arbitrary decision at best, and set carbon dioxide as the basis for comparison.

The problem with this approach is that some gases, such as methane, have a very short lifespan - 12 years. During this lifespan warm the climate between 86 and 105 times more powerfully than carbon dioxide (IPCC AR5). Measuring their impact over a 100 year time period masks their short-term impact significantly, underestimating it by a factor of at least 4. This is like telling your friend who just burned their hand on an oven tray to chill out – it should have felt only lukewarm if you measured it over a longer period of time!

Recently, the UNFCCC's periodical summary report, the 2013 Intergovernmental Panel on Climate Change (IPCC) report, has stated that there is no scientific basis for the decision to use the 100 year time frame. Furthermore, using a shorter time frame, such as 20 years, is fully acceptable (Chapter 8.7). This is likely one of the reasons why the IPCC has underestimated climate change to date, which is [highly dangerous](#) from an adaptation perspective.

## Where do these gases come from?

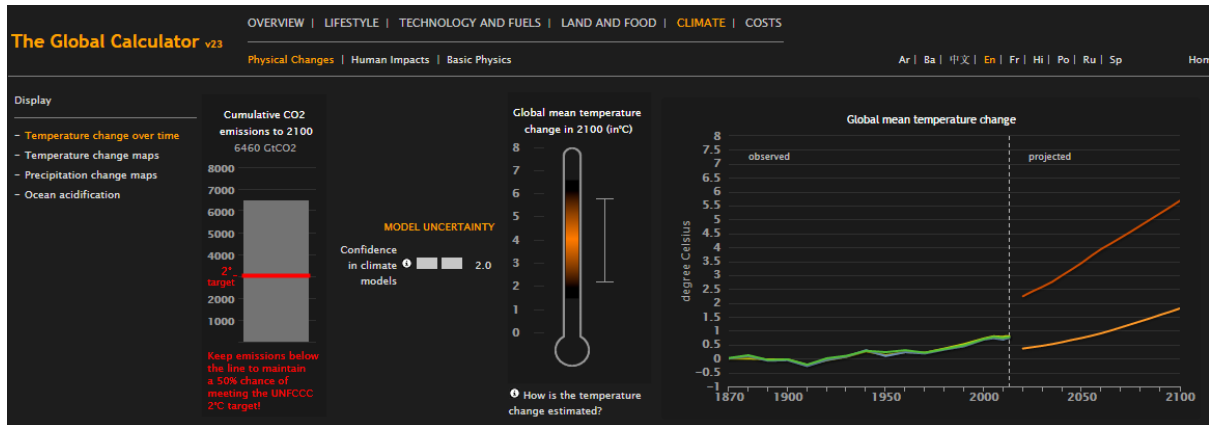
I'm guessing you are like me and not a scientist so I'll keep this as brief and simple as I can. Firstly, the expansion of grazing lands and land for feed crop cultivation often require deforestation. The extent of such deforestation to grassland varies from country to country, with the most extreme example being the Amazon rainforest where [91% of deforestation](#) is for the expansion of livestock agriculture. This activity both destroys the carbon sequestration potential of that land and subsequently emits carbon dioxide and methane through the resultant soil carbon loss. Secondly, the prescribed burning of savannah for pasture maintenance results in the emissions of carbon dioxide, methane and nitrous oxide. As for the ruminant livestock themselves, mostly sheep and cows, they produce vast quantities of methane during their digestion process which they emit through belching – that's right, burping!

## Why is this a problem?

The narrow focus on fossil fuel emissions, even with drastic cuts, can lead to runaway climate change that could spell the end of civilisation as we know it. This is not hyperbole. This is, rather, the conservative predictions of many climate scientists using cutting-edge climate models to predict different emissions pathways based on our action or inaction in reducing fossil fuel emissions. Furthermore many of these pathways incorporate carbon sequestration technology that is not scalable or feasible at the levels they predict, nor may it ever be according to the [UNEP Emissions GAP report](#).

Once these are taken out of the equation you will see that each of these pathways will lead to catastrophe. This is largely due to the short-lived yet powerful emissions from the livestock agricultural sector. But don't take my word for it – you can see for yourself right now thanks to the Global Calculator. The Global Calculator is an easy-to-use climate model developed by the UK Department of Climate Change and Energy in conjunction with climate scientists around the world. It was developed to be used by anyone and everyone to show that "[it is possible](#) to prevent dangerous climate change and ensure people's living standards continue to improve if we act now".

We will be looking at two scenarios here developed by independent policy institute Chatham House comparing the ‘high-meat’ pathway with the ‘low meat’ pathway. The ‘high meat’ pathway models a scenario where countries undertake ambitious mitigation action in every sector of society apart from diet to avoid two degrees of warming. As you can see below, the mean temperature would continue to rise past 4 degrees by the turn of the century which would result [in profound and irreversible changes that human civilisation may not be able to adapt to.](#)



Although a full discussion of the end result of such a horrifying scenario are outside the scope of this discussion, this will give you an idea of some of the impacts closer to home:

*Australia’s population health will face much more than frequent heat waves and weather disasters. There will be food shortages, malnutrition, increases in many infectious diseases (including epidemic outbreaks), widespread depression, anxiety and rural misery, and tensions and conflicts over resource shortages, population displacement and refugee flows.*

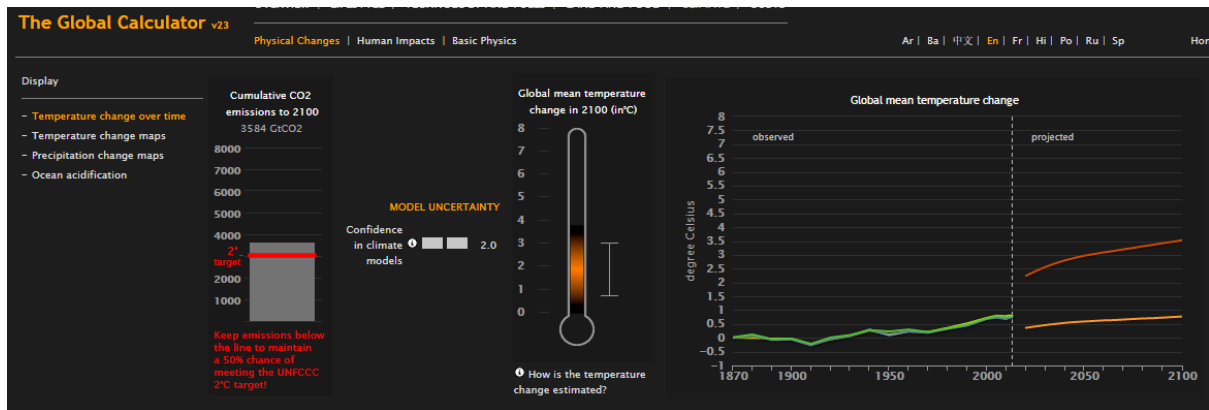
*.. drought and food shortages would cause displacement of up to 250 million people across West Asia, South Asia, South-East Asia and Indonesia by the end of this century.*

*Sea-level rise and storm water intrusion would cause further massive dislocation of coastal communities, the abandonment of coastal cities, and severe economic disruption in China, Bangladesh and Indonesia. The abandonment of uninhabitable low-lying islands in the Pacific would create displace whole national populations.*

*(The above is quoted directly from this article in [The Conversation](#))*

Hence our current so called ‘situation’ of a few thousand refugees a year arriving by boat would literally be a drop in the ocean compared to this scenario.

Now it’s time for some good news – the ‘low meat’ scenario. Within this scenario very low mitigation efforts are made throughout the energy sector but this is counter-balanced with major shifts in global diet, including a drastic shift away from ruminant livestock meat such as beef and lamb towards much lower-emitting meats such as chicken and pork. Furthermore there is a vast redistribution of meat consumption between developed and developing countries with the end result being average meat consumption of 90 grams per day [as recommended by the World Health Organisation](#) (WHO). This scenario results in a climate vastly different from that of the ‘high meat’ scenario where two degrees is narrowly avoided at a very low mitigation cost.



Now you can see for yourself how meat is both the biggest threat *and* the biggest opportunity when it comes to climate change.

## Why have no others done this?

To date there has been little to no consideration of climate impacts of diet in either government policy or the communications strategies of various environmental NGOs worldwide. Considering the major risk and opportunity presented by the livestock agriculture sector in relation to climate change, this is very troubling to say the least. Recent studies from the aforementioned Chatham House have found a number of reasons for this policy and action vacuum from the public and non-profit sectors described below.

- Public resistance to intrusion** – policy makers in government are afraid of public resistance to perceived intrusions into their private lives, especially into something perceived as personal and intrinsic as eating. However this is largely unfounded as governments regularly release dietary guidelines to promote health so as to reduce the burden of health care costs. Therefore a dietary policy response to climate change would be no different, not only promote health through reduced consumption of meat but also reducing current and future climate change adaptation costs.
- Cultural significance** – Meat enjoys an aspirational status in many countries, especially developing countries with a growing middle class such as China, where beef is nicknamed '[millionaire meat](#)'. This presumption can also be rebutted but with varying degrees in different countries depending on how deeply entrenched such beliefs actually are. Such a rebuttal can come in the form of developed countries setting a new ideal to aspire to which would not take long to filter down.
- Private sector resistance** from powerful interest groups, such as the Meat and Livestock Association (MLA) in Australia. Since there has not yet been a massive push for such policies and communications strategies to date we are yet to see the full force of such a backlash in both media and lobbying. However we are already starting to see this in the US with the [recent proposed dietary guidelines that incorporate environmental concerns](#). The US beef industry has fought back vigorously with lobbying efforts and petitions such as the '[Hands off my Hot Dog](#)' campaign. That being said we should not allow the private sector to influence policy for their benefit at the cost of our current and future livelihoods, especially when it comes to a threat as terrifying as climate change.

- **Public ambivalence about climate change** – this ambivalence varies from country to country, however as the impacts of climate change increase in their intensity and frequency, especially in the form of extreme weather events, this ambivalence likely to very quickly evaporate.
- **The gap between awareness and action** has been studied in depth and basically shows that the extent of awareness about any particular environmental issue has little to no correlation with resultant personal actions to mitigate such issues. The most well-known study in this field is called '[Mind the Gap](#)'. This phenomena is especially evident in the humorous anecdotes of climate scientists jetting around the world, taking holidays in exotic locations, as described in George Marshall's [Don't Even Think About It](#). Recent research into this gap in relation to climate change have shown there are ways to overcome this phenomenon such as [making global warming 'local'](#), making it easy to understand and leading by example.
- **Lack of belief that individual action can make a difference** – this is a tricky one as research suggests that even those 'in the know', such as climate scientists and climate activists either share this belief or show it though their behaviour. For instance research participants who described themselves as environmental activists attempted to lower their carbon footprints in their own lives, by actions such as cycling instead of driving, yet [did not believe that personal action would be sufficient to solve climate change](#).
- **Uncertainty regarding efficacy of such policies** is by far my favourite reason for inaction due to its inherent circular logic. Basically it states the reason for inaction as the lack of evidence that such action can actually work. This is self-perpetuating so long as governments and climate action organisations lack the courage to go for it and implement such policies and communication strategies. This is also a false assumption as many studies and real world examples exist of such policies and strategies actually working, such as the water restrictions in Victoria throughout the last drought only a few years ago.

(Source – Chatham House, [Livestock – Climate Change's Forgotten Sector: Global Public Opinion on Meat and Dairy Consumption](#))

Hence none of these reasons stand up to scrutiny, especially in the face of the biggest challenge to human civilisation to date.

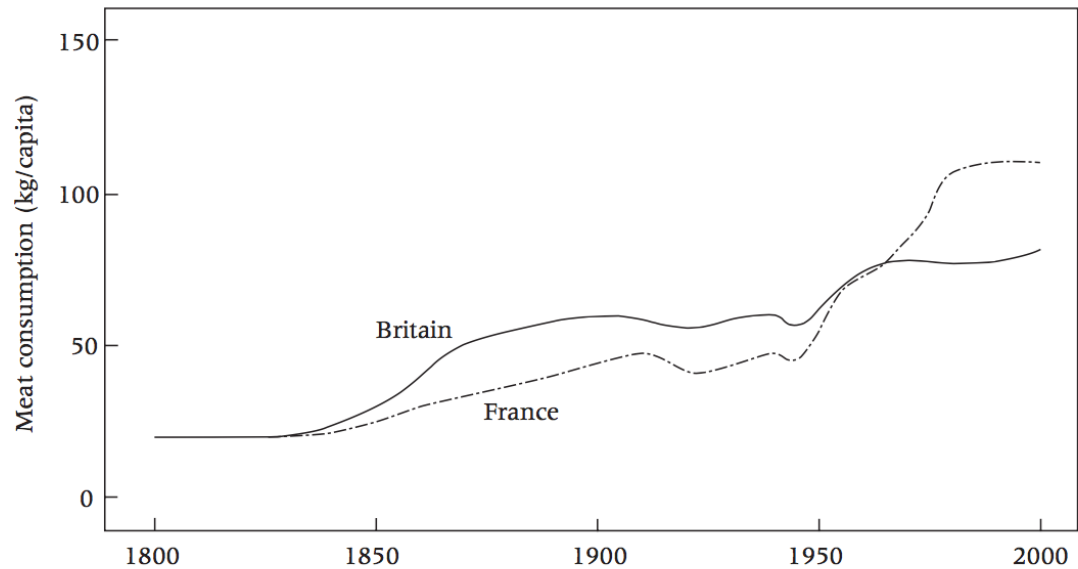
## Meat consumption – then and now

Consumption patterns of meat have changed drastically throughout human history, especially since the 1950s. Historically, according to a [recent study](#), people living in subsistence peasant societies of the Old World consumed no more than five to ten kilograms of meat per year since it was both expensive and difficult to preserve for long periods of time. People in such societies ate small quantities of meat no more often than once a week and would only consume large quantities of meat during special festive occasions in the form of roasts and stews.

The graph below shows per capita meat consumption trends over time in Britain and France since 1800. The increases in consumption evident here largely stemmed from the proliferation of refrigeration technology allowed by electricity produced by the burning of fossil fuels since the industrial revolution. The second spike in the 1950s came from the spread of refrigeration

technology into people's homes, where previously it was only available to the sellers of meat, such as butchers.

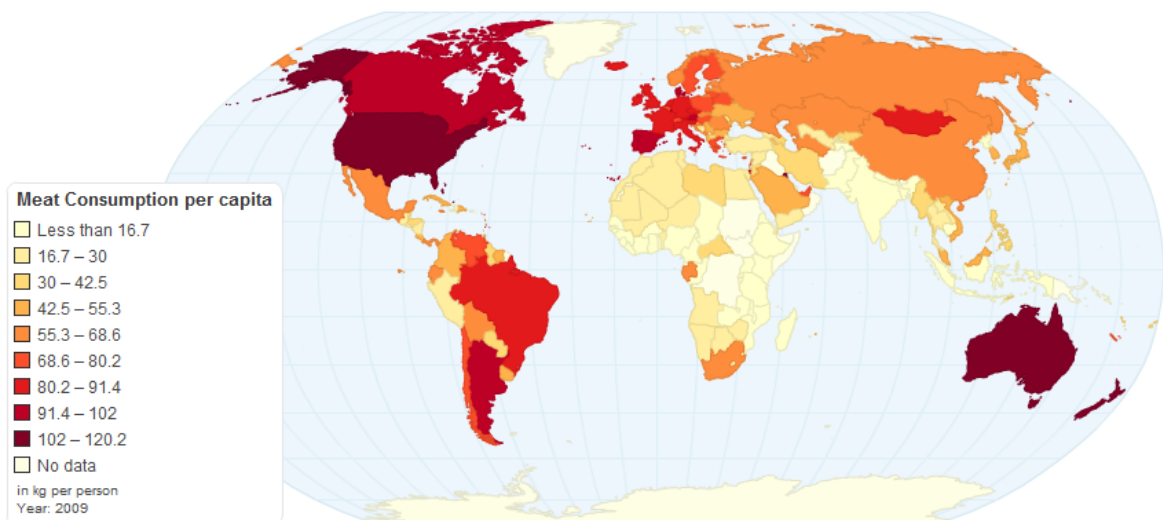
**FIGURE 1 Meat consumption in France and Britain, 1800–2000**



SOURCES: Average per capita rates according to Toutain (1971); Dupin, Hercberg, and Lagrange (1984); Perren (1985); and FAO (2002).

Nowadays the picture of per capita meat consumption is very different, with the middle classes of most developed and some developing countries over-consuming meat while lower-socio-economic classes under consume meat. Australia has followed suit with [annual per capita meat consumption now topping 111.5 kilograms](#). As can be expected the majority of developed countries in Western Europe and North America show similar figures while developing countries in Asia and Africa conversely under consuming meat relative to WHO recommendations mentioned earlier (90 grams per capita per day = 32.85kgs per capita per year). The distribution of per capita meat consumption can be seen in the [graph below](#).

**Current Worldwide Annual Meat Consumption per capita**



## Why we consume meat

We consume meat for many different reasons, some of which are valid while others are misinformed at best. I have already mentioned an example of the latter with meat being an aspirational symbol of success. Meat consumption is often associated with manliness which is purely cultural and has no roots in evidence-based science. Another common misconception is that we need lots of protein to survive and that meat is the best source of such protein. The [Australian recommended daily intake](#) (RDI) of protein is 0.75 grams of protein per kilogram of body weight for adult women and 0.84 grams of protein per kilogram of body weight for adult men – this is far lower than the reality.

Furthermore, meat is not the only source of high quality protein as protein can be derived from many non-meat sources including nuts, seeds, dairy, beans, soy, cereal and spinach. Taste is another commonly voiced reason for eating meat with every meal. However many professional chefs, such as [Jamie Oliver](#), advocate eating a mixed diet with less meat to experiment with a broader variety of flavours available in plant based recipes. This is only the tip of the iceberg and there is a lot of work to be done to educate the public and clear up these misconceptions to allow for both a healthier and more sustainable diet for all.

## Healthy diet for a safe climate

The biggest driver for the stationary energy industry is demand for electricity and similarly, the biggest driver for livestock agriculture is demand for its products, mostly being beef and lamb. The transition of the stationary energy industry towards renewable energy has been shown to be costly both from a financial perspective and from a temporal perspective. Furthermore it has been hindered by a lack of political will to do so. Conversely the transition towards a diet consisting of significantly reduced amounts of beef and lamb, more in line with WHO's recommendations from a health perspective (approximately a quarter of the amount of meat consumed in western countries) would cost nothing and actually result in improvements in health to those populations which could actually reduce health care costs. Therefore a sharp reduction in the consumption of beef and lamb amongst the increasing global middle-class population proves to be the 'low hanging fruit' from a climate change mitigation perspective. Furthermore, a transition towards a society powered completely by renewable energy without a sharp reduction in agricultural emissions would still tip the global climate into dangerous territory.

The livestock agriculture sector also holds the key towards reducing the concentration of carbon in the atmosphere. Livestock agriculture uses approximately [30% of the world's scarce fresh water resources](#) (32% in Australia), [70% of the world's ice free land](#) and is responsible for most of the deforestation, especially in tropical rainforests such as [the Amazon rainforest](#). This is a massive opportunity from a carbon sequestration perspective once these vast land and water resources are freed up through smart reforestation focused on building up the soil-carbon using industry best-practices. This requires [no further investment into carbon capture and sequestration technology](#) yet to show any signs of feasibility. It would simply require the implementation of policies aimed at rewarding such carbon sequestration practices on land reclaimed from the highly destructive livestock agriculture sector. Furthermore this would have major benefits from a biodiversity perspective.

## Change the Less Meat Less Heat way

The solution proposed by Less Meat Less Heat is as follows. Less Meat Less Heat is sparking a global movement of people adopting a “climatarian” diet to rapidly address climate change while also improving their health. This involves reducing the overall amount of meat and dairy consumed, especially the types of meat most damaging to the climate such as beef and lamb. We are taking a pragmatic approach and thus not telling people to go vegan for the climate or even vegetarian. We want to engage the mainstream public who are mostly omnivorous with a fun and exciting challenge called ‘The Climatarian Challenge’. People will compete with their friends and family and we will support them with fun activities and easy recipes.

Less Meat Less Heat was only founded a few months ago in March 2015 but since then we have already kicked some major goals. For instance we have featured on radio shows and podcasts, we have a basic website up and our Facebook page has more friends than I do (which isn’t really that hard!). We are quickly building lots of momentum and our team of dedicated and passionate volunteers are working hard for a nationwide launch later this year. Once we are established in Australia we plan to quickly expand to many other countries around the world.

## But what about the farmers?

Ultimately we would like people to eat less meat, especially beef and lamb which are most damaging to the climate - and when they do eat meat, to purchase better quality meat both in terms of animal welfare and sustainable farming practices. Such practices would reduce environmental impacts and improve the land rather than degrade it. Therefore we would like policies put in place to reward such farming practices. The global reduction in demand would potentially lead to loss of jobs but since it would occur gradually the industry will have time to adapt gradually. This transition should be supported by progressive government policy.

The broader discussion of which government policies such a transition would require has yet to be had but we already have some ideas of what it could look like. Firstly, the grazing land which can be returned to forest should be returned to forest to act as a carbon sink through the build-up of soil carbon. The range lands where this is not possible could be converted to [far more sustainable and lower-emitting kangaroo meat production](#) and the construction and running of renewable energy production plants utilising [Australia’s abundant solar resources](#).

## Conclusion

Climate change cannot be solved by a shift away from fossil fuel power to renewable energy alone and diet must play a significant part of the solution. Livestock agriculture holds the key to the drastic reductions in emissions required to avoid catastrophic climate change, as well as the potential to sequester a large amount of carbon we have already released into the atmosphere relatively cheaply and easily. The lever required to make this happen is a drastic reduction in the consumption of livestock meat – beef and lamb.

How is this going to happen? We at Less Meat Less Heat have some ideas including the adoption of a climatarian diet as well as the Climatarian Challenge. Visit our site at [www.lessmeatlessheat.org](http://www.lessmeatlessheat.org), like our Facebook page and if you have a few extra hours to spare and want to be part of the solution then please email us at [contact@lessmeatlessheat.org](mailto:contact@lessmeatlessheat.org) to join our team. We have a big challenge ahead of us and need all hands on deck!