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Who owns renewable energy? The advantages of Aristotelian-influenced ownership

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ABSTRACT As renewable energy becomes increasingly important, we may ask philosophical questions such as *who owns renewable energy?* Due to renewable energy's widespread nature and its potential for domestic harnessing, it suits an Aristotelian-influenced ownership type where the energy is largely harnessed by individual, self-reliant households. Such an ownership type also is advantageous, in that it would encourage sustainability, support the rights of small groups and provide a form of social justice. Hence, it offers a route for developing future energy policy, and may be favoured by societies largely composed of self-contained homes but could also cater for small communities.
KEYWORDS Renewable Energy; Aristotle; energy transitions; decentralised energy; social justice.

RESUMO À medida que as energias renováveis se tornam cada vez mais importantes, podemos colocar questões filosóficas como: quem é o proprietário da energia renovável? Dada a natureza amplamente distribuída das energias renováveis e o seu potencial para ser aproveitada a nível doméstico, esta adequa-se a um modelo de propriedade influenciado por Aristóteles, em que a energia é, em grande medida, gerida por lares individuais e autossuficientes. Este tipo de propriedade apresenta ainda vantagens, pois incentivaria a sustentabilidade, apoiaria os direitos de pequenos grupos e promoveria uma forma de justiça social. Assim, oferece um caminho para o desenvolvimento de políticas energéticas futuras e poderá ser preferido por sociedades compostas, em grande parte, por habitações independentes, embora também possa servir pequenas comunidades.
PALAVRAS-CHAVE Energia renovável; Aristóteles; transições energéticas; energia descentralizada; justiça social.

1 Introduction

It is now accepted that the use of renewable energy will become more commonplace in the future. As fossil fuels become unpopular due to their contribution to climate change,[1] new ways of gaining energy

1 An affiliate of the United Nations, namely the Intergovernmental Panel on Climate Change, fell short of naming fossil fuels as the cause of climate change but noted that "Human influence

will be needed. Moreover, as harnessing and storing equipment becomes more affordable on a smaller scale, the harnessing of renewable energy in households can expect to be more widespread:[2] as opposed to conventional, large-scale energy generation. However, the transition from fossil to renewable power, and shift from large, *centralized* generation to small, *domestic* operations may raise philosophical questions such as, *who owns renewable energy?*

The *raison d'être* of this work is quite simply that this question has not yet been adequately debated in formalized academic settings with a view to philosophically justifying ownership.[3] Also, an attempt has been made to answer the question by utilizing "applied philosophy", which may be defined as "the application of philosophical reasoning to matters of practical concern" (Overgaard, et al., 2013, pp. 206-7).

Here, when discussing "renewable energy" the focus is upon types of energy that can be converted into, stored, and transported as electricity. This is because such forms of energy usage may expect to become more prevalent in the future and replace other variants of renewables. To elucidate, although many persons' current experience of renewables consists of gathering firewood for burning, these are methods that would hopefully be surpassed with the popularization of small-scale devices for harnessing renewables. Additionally, although ethanol and methane can be produced as biofuels, and transported via pipeline, it will often be far safer and more convenient to transport electricity. Hence, this discussion revolves around the electrified types of renewable energy that will be expected to be more important in the future.

This work also focuses upon energy harnessed by both households and public schemes; as this is where Aristotle's concentrated. It is realized that commercial production would remain, particularly in industrialized societies, and the extent of this activity would depend upon how much of an industrial base a society has: highly industrialized regions may require most energy in manufacturing and therefore commercial ventures may be the greatest producers of energy in some societies.

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has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, and in global mean sea-level rise; and it is *extremely likely* to have been the dominant cause of the observed warming since the mid-20th century" (original author's italics) (Intergovernmental Panel on Climate Change, 2014, p.12).

2 Although the term 'household' is used here, and alludes to supplying a family with energy, the principles demonstrated could feasibly also be applied to a range of entities from individuals to any small groups owning harnessing and storing equipment.

3 Inroads have been made by the author (Fagan, 2020).

Delving further into the concept of ownership employed for the purposes here, it should be noted that prior to producing any energy, the producers may be expected to own: the harnessing and storing equipment; the surrounds in which the energy is harnessed; and any relevant responsibilities. Furthermore, this allows the product of renewable energy itself, to be considered to be akin to *personal property*; property that can be stored, used, and traded.[4] [5]

It should also be noted that renewable energy can be gained from more environments than ever before: solar power, wind power, hydroelectric power, wave power, tidal power, biofuels,[6] heat pumps, geothermal power, and hydrogen are all at humanity's disposal. With this variety, it should be further noted that many technologies for the adequate harnessing and storage of energy at a domestic level are currently available.[7] Moreover, renewable energy is constantly replenished, and in 2011, the Massachusetts Institute of Technology calculated that 10,000 times the human energy needs reaches the Earth from the Sun (Chandler, 2011). Therefore, renewable energy provides an enormous boon for humanity.

In addition, this work contains the expectation that future energy usage should be an improvement over past energy regimens: in particular, the introduction of renewable energy should not profligately use resources or damage the environment, and it is presumed that the widespread introduction of renewables would not be detrimental overall.

Less obviously, the introduction of small-scale harnessing and storage, should provide a more just situation for humanity, as access to energy would not depend upon brute luck and be contingent upon the society one happened to be born in. Ideally the distribution of energy should be enjoyed by all worldwide, and therefore it should allow greater

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4 Comparisons may be made with the work of Tony Honoré, who defined eleven identifiable elements operating within the concept of liberal ownership: rights to possess; rights to use; rights to manage; rights to the income; rights to the capital; rights to security; the incident of transmissibility; the incident of absence of term; the duty to prevent harm; liability to execution; and residuary character (Honoré, 1987, pp. 161-179). Although, as it will be later explained, within Aristotle's theorizing, control over *income* would be weakened as a household should strive for self-reliance and moderation, and less *management* may be exercised as households should really practice generosity.

5 From hereon, discussions concerning harnessing and storing equipment, the surrounds in which the energy is harnessed, and any relevant responsibilities, also include situations where the borrowing, leasing, renting, or hiring of premises and equipment has occurred.

6 Here, "biofuels" is a very terse term that incorporates many sources of energy: at its most simplistic it would include burning plant matter for fuel; in more advanced forms it would include combustible liquids and gases gained from complex processes.

7 An overview of the current situation in the UK is provided by the Energy Saving Trust (Energy Saving Trust, 2025).

equality of opportunity in obtaining energy. Moreover, it should allow greater equality of condition as the routine tasks such as cooking, washing, maintaining an abode at a reasonable temperature, and providing lighting should be available to all.

Pursuing the spirit of improvement, it was asked, what attributes should a suitable "ownership type" entail? *Climate justice* was considered, whereby all should flourish in their local environment with the shared atmosphere restored: but as already noted, renewable energy is available in most environments and should not damage the atmosphere, and therefore contributes to realizing this overall aim. Also, *international justice* was considered, but this is an attribute of current inequality that may be expected to become less important here: as developing societies are often situated in the tropics and receive great amounts of solar radiation, a process of equalization may be realized when harnessing and storing equipment spreads globally.

It has previously been argued that the most suitable ownership type for renewable energy should be capable of fulfilling the attributes of human rights, group rights and domestic generation (Fagan, 2020, p. 122). In fulfilling these attributes, it will be explained that although an Aristotelian-influenced ownership type would not be considered to be an ideal model, it is considered a *viable* ownership type as it offers an alternative to human rights, partially fulfils group rights, and fully addresses domestic generation; additionally, it offers the attribute of sustainability. Hence, these are considered to be *advantages* that may be realized when using an Aristotelian-inspired ownership type and these will be described in more detail over the next few paragraphs.

While it has previously been argued that the ideal ownership type should promote a notion of human rights and provide a minimum standard of energy provision for all (Fagan, 2020, p. 122), it is considered here that Aristotelian thinking would not directly address these concerns: instead an application of Aristotelian theory to renewable energy would yield a variant of *social justice*.[8] Here, social justice may be understood as being a concept of awarding goods above the level of merely having

8 With regards to human rights, Aristotle is subject to differing interpretations. For instance, Martha Nussbaum has described Aristotle's work as "grossly defective as it lacked a theory of basic human rights" (Nussbaum, 1997, p. 276): whereas others, following an explanation offered by Rosalind Hursthouse, may argue that such rights need not be the primary object of concern in a "properly functioning society" that seeks both justice and human flourishing, and applies adequate laws and conventions to achieve this (Hursthouse, 1991, p. 235-6). However, those adhering to Nussbaum's stance may be expected to be more accepting of notions of social justice operating within an Aristotelian society, and this view is explained in the section entitled "Social Justice".

one's rights satisfied, where all members of a society may interact with each other as equals, and its absence may undermine a sense of "fellowship" within society (Kymlicka, 2002, p. 197). As such, social justice can be considered a desirable advantage within any ownership model.

The advantage of *group rights* is also offered, and this is included as it may be necessary for people to gain their energy from a "group". Some may choose to join a group as this may allow them to benefit from economies of scale, or they may join a group out of necessity as their own preferred level of welfare cannot be satisfied by small-scale generation. Furthermore, those accustomed to communitarian living may prefer such arrangements. Additionally, although some may be able to harness sufficient amounts of energy from within their own households, they may choose to share a communal storage facility, such as a large battery, and this may be relevant to those anticipating temporary and local shortages of renewable energy. However, it should be realized that renewable energy is unevenly distributed, and some locales may reasonably have only one source which must be shared. Hence, it may be necessary for people to cooperate to acquire enough energy and therefore group rights must be recognized.

The advantage of the *domestic harnessing* of renewables is becoming clearer as time progresses and it is difficult to exaggerate its increasing importance. As renewables are widespread and unlimited, combined with increasingly cheaper harnessing and storing equipment becoming available, then this allows a convenience in obtaining energy. This reduces the need for energy transportation via a grid, and moreover, it is not unfeasible that any identifiable entity could anticipate enjoying a self-sufficiency of energy; especially where a variety of energy resources are combined such as: solar energy, wind power and heat pumps.[9] This latter factor has its own benefits as it could prevent power outages from occurring over whole districts, leading to much localized suffering. Whilst at an individual level, it avoids the imposition of unforeseen or creeping price rises on households, due to fluctuations in energy markets, making energy unaffordable: once relevant equipment has been

9 Research has been carried out to optimize systems utilizing differing types of energy sources simultaneously, such as solar, wind and heat pumps for domestic usage. There are examples described as "combined renewable heating" systems (Haller et al, 2013, p. 667), and "hybrid" systems (Boukettaya and Krichen, 2014, p. 149). More recently in the UK, systems using solar power and batteries have been successful in providing energy to 200 homes (Centrica, 2021); and although this arrangement is still connected to an energy grid, it should be appreciated that this is close to being a truly independent and self-reliant arrangement.

installed it should produce energy very cheaply. Hence, the most apt ownership types should be able to accommodate domestic harnessing.

Focusing upon the advantage of *sustainability*, it is common sense that people cannot use the Earth's resources *ad infinitum* and it is therefore necessary to support this notion. Moreover, this type of approach would expect to gain international support as the concept of "sustainable development" has been encouraged by the United Nations: in 1987, the United Nation's publication, *Our Common Future* defined it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations WCED, 1987, p. 43). Such a definition, with its emphasis of refraining from mitigating the needs of future generations, would indicate that humanity should follow a path that preserves the goods that people enjoy today for the enjoyment of future humanity.[10] Ideally, the notion of sustainability should accompany renewable energy's popularization and be present within its operation.

It should be noted that the consideration of all the advantages has allowed new views of ownership to be investigated: hence, established means of ownership, such as privatized or socialized energy supplies, as two examples, were not the prime focus of this study. Instead, the ownership models offered by a wide variety of political philosophies were reviewed: including libertarian, liberal, egalitarian, and communitarian.[11]

In answering the question posed, this work will argue that an ownership type based upon Aristotle's ideas would provide a *viable* ownership type for renewable energy. A description of the application of Aristotle's work follows. Then it is explained more fully how Aristotle's thought provides the advantages noted. This is followed by a section dealing with some queries concerning the practical introduction of Aristotle's ownership type. Before concluding, some anticipated criticisms from other theoretical perspectives are aired.

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10 The prospect of considering future generations is admittedly fraught with difficulties, although here it is accepted that they would have needs similar to those of today. One commentator, Ernest Partridge, has provided various criticisms including: future persons do not have rights, and cannot as they do not exist (Partridge, 2001, p. 379); and we cannot possibly anticipate who the future people will be (Partridge, 2001, p. 379), and therefore cannot predict their future needs.

11 Twelve political philosophies were reviewed. Aristotle, Locke, and Rousseau were found to be front-runners as they favoured domestic harnessing whilst providing additional noteworthy advantages. The others were: Robert Nozick; Michael Otsuka; JS Mill; John Rawls; Karl Marx; the capabilities approach; Robert Owen; the Hutterite settlements of North America; and Murray Bookchin.

2 Aristotle's ownership philosophy defined and applied

The ownership ideas featured here originate from Aristotle's *Politics* and *Nicomachean Ethics.* Also, much reference is made to the concept of "virtue" which is interpreted here as beneficial personal qualities, and although there are many such attributes that could be included,[12] this work is largely concerned with *moderation*, *self-reliance*, and *generosity*. However, virtue should become engrained within a virtuous person and be displayed repeatedly: to this effect, a virtue may be defined as "a trait of character, manifested in habitual action, that is good for a person to have" (Rachels, 1993, p.163).

Nevertheless, virtuous individuals comprising a virtuous society would need to acquire many skills gained from the experience of life to reach a state of *phronesis* or practical wisdom (Hursthouse, 2022). To explain, in enacting the virtue of generosity, which may be defined as "the willingness to expend one's resources to help others" (Rachels, 1993, p.164), the wise individual would avoid giving too little assistance, as this may not be enough to aid the recipient, and would also avoid giving too much assistance, as may cause the vice of dependency (Rachels, 1993, 164): hence, generosity would lie between stinginess and extravagance. Also, the virtuous individual would need to recognize some situations as being more important than others, such as prioritizing recipients who are most in need (Hursthouse, 2022).

However, the application of the relevant virtues is developed and explained in the following paragraphs. In particular, it is explained: why an habituated mindset would be needed; why the private ownership of property would dominate; and why a surplus of energy would be needed. This section ends noting that some publicly owned facilities for utilizing renewable energy would also be needed.

For Aristotle, an initial problem with encouraging virtues is that most people do not naturally behave virtuously, and Aristotle advised the introduction of a dual solution. Firstly, the state should provide a process of habituation so that virtues would be instilled in persons. Now, Aristotle realized that executing some virtues required sacrifice from individuals and so the habituation process would start early in life, acclimatizing individuals so that the constant execution of virtue caused

12 James Rachels lists 24 virtues and describes them as a "reasonable start" (Rachels, 1993, p. 163).

no conscious suffering later (Aristotle, 1980, pp. 270-71). To achieve this Aristotle recommended a common education for all, which would also encourage an element of equality amongst citizens (Aristotle, 2000, p. 165), and he praised this aspect of the Lacedaemonian education, which was "the business of the state" (Aristotle, 2000, p. 300).

Secondly, the habituation process should be accompanied by deterrents to encourage compliance. Although some individuals would be expected to respond to the habituation process, others would only respond to punishment (Aristotle, 1980, p. 271), whilst "the incurably bad should be completely banished" (Aristotle 1980, p. 271). Now, Aristotle did not supply proportions as to who would comply via the habituation process and who would not, but it may be expected that he felt that the vast majority of citizens would: otherwise, he could have been expected to place more emphasis upon instituting deterrents. Although, the habituation process was not expected to be completely effective due to the presence of the accompanying deterrents, if the overwhelming majority of individuals became habituated, then it can be accepted that the habituation process instils a group "mindset".

At this point it may be wise to define the concept of a mindset. It may be interpreted as the lodging of a thought process in an individual, whereby it would be difficult for that individual to tolerate any contrary thought processes. The benefits of mindsets may be realized when they are considered to be evolutionary devices which allow individuals to become knowledgeable in an environment and efficiently transfer information to colleagues inhabiting the same environment (Snyder, 1998, pp. 1-3): an aspect of humanity effectively adopted by Aristotle.

Turning to look at the effect of the habituation process, it should be noted that it could easily be arranged to instil the virtue of moderation over property ownership. Although Aristotle felt that the "equalization of properties" was beneficial (Aristotle, 2000, pp.73-4), he was also aware that individuals require different holdings to match their differing welfare needs. Hence, the habituation process cannot be considered to be prescriptive, dictating how much or which type of goods to own, but instead an influence making the amount of goods that individuals desire more equal:

> *Again, where there is equality of property, the amount may be either too large or too small, and the possessor may be living either in luxury or penury. Clearly, then, the legislator ought not only to aim at the*

> *equalisation of properties, but at moderation in their amount. Further, if he prescribes this moderate amount equally to all, he will be no nearer the mark; for it is not the possessions but the desires of mankind which require to be equalised, and this is impossible, unless a sufficient education is provided by the state (Aristotle, 2000, pp.73-4).*

Apart from promoting the importance of moderation, Aristotle also promoted the private ownership of property. Using their own private property, in the form of a household, Aristotle would recommend that citizens should engage in "household management" for the purposes of "living well" as opposed to "money-making" (Aristotle, 2000, p.44); including necessary activities such as "the provision of food" (Aristotle, 2000, p. 45). Overall, the concept of owning property is accepted here as being integral to both living virtuously and the operation of an Aristotelian-influenced ownership type.

That said, although Aristotle believed in the private ownership of property, he also believed in the existence of a shared element within its produce:

> *For, although every man has his own property, some things he will place at the disposal of his friends, while of others he shares the use with them. The Lacedaemonians, for example, use one another's slaves, and horses, and dogs, as if they were their own; and when they lack provisions on a journey, they appropriate what they find in the fields throughout the country. It is clearly better that property should be private, but the use of it common; and the special business of the legislator is to create in men this benevolent disposition (Aristotle, 2000, p. 62).*

If we bear in mind the habituation process that Aristotle recommended, it may be assumed here that the "benevolent disposition" imparted by the "legislator" would inform individuals as to how much they could sensibly appropriate, and also how much benefactors should expect to donate. Hence, although a donor can be expected to be generous, it is not unforeseeable that the recipient should be able to take sensibly.[13]

13 In deconstructing the above passage from *Politics*, Robert Mayhew identified three distinct types of usage he attributed to Aristotle: private usage where the owner of the produce dictates the produce to be used privately (Mayhew, 1993, p.816); usage between citizens where an agreement exists (Mayhew, 1993, p.816); and an ***ad hoc*** availability for travellers (Mayhew, 1993, p. 818). Furthermore, Mayhew argued that an owner would ***indicate*** that

With regards to renewable energy, the virtue of generosity may work like this. If you are visiting an area and your own energy reserves had run low, you may plug into a renewable energy owner's system and charge your car, phone, or laptop to a reasonable level.

After this description of Aristotelian-influenced ownership, there seemingly remains an element of contradiction, which requires an assumption to be made. One should be independent and own private property in order to live moderately: but then one is expected to be generous to others. If one is only producing enough goods to live a modest life: then one may not have any surplus goods to enact such virtues. Either one would have to deliberately produce enough to share, or one would only be generous with an accidental surplus. Here, it is assumed that the property owner would deliberately produce more than needed for moderate usage, and it is from this surplus that generosity would arise.

Overall, an Aristotelian-influenced ownership type, when applied to renewable energy in a household may be defined thus:

1. Households should own property, including harnessing and storing equipment, and the product of renewable energy.
2. Households may harness enough renewable energy to allow them to live virtuous lives.
3. Households should harness extra renewable energy to share with others who temporarily need energy.

In short, households should harness renewable energy to both allow them to live virtuous lives and provide energy for others to use.

Although the majority of renewable energy available in an Aristotelian-influenced model may expect to be of domestic origins, it is highly likely that society would also produce energy for concerns that it felt to be important. Aristotle described how he would also wish to see some land held as a common asset within a society, with its produce used to both provide common meals for all citizens and to fund a city state's religious needs (Aristotle, 2000, p.278). Of course, common meals would be a boon to the state's poorest members and its role here is interpreted as a device to prevent malnourishment in society.

goods are available to share for *ad hoc* usage, by unfencing farmland as one example (Mayhew, 1993, pp.819-820). He referred both to Xenophon's *Lacedaemonian Constitution* and the *Athenian Constitution* to reach this conclusion.

Religious events would also be expected to create a bond between society's members.

However, it is possible that the spirt of Aristotle's work pitched at a societal level, could be employed within the area of renewable energy. To clarify, harnessing equipment could be owned by society to provide energy to energy-needy citizens, such as the infirm or incapacitated, who cannot harness energy themselves in any way. Also, such energy could be used to power services that benefit all, such as street lighting and public transport.

3 The advantages of Aristotelian thought

In this section, it is demonstrated how Aristotelian ownership addresses the advantages of social justice, group rights, domestic harnessing, and sustainability.

3.1. Social justice

Here it is argued that with regard to renewable energy, a variant of social justice, where all citizens would equally enjoy the right to moderate energy usage and a sense of fellowship would arise.[14] This would occur in three areas: firstly, by households being generous with the energy gifted to others; secondly, by society's public harnessing facilities distributing energy to the energy-needy; and thirdly, by society's public harnessing facilities providing services that all share.

The shared element within produce, which is here considered to be energy gifted by households, has already been noted. But the question arises, how far this would benefit the energy-needy? Certainly, when households act generously by allowing others to recharge their electronic devices from their stores of energy, this would encourage a definite fellowship based around energy usage. However, although it contributes to social justice, sharing produce may be considered to be merely a device to make the wheels of society move more easily, and it

14 The commentator Michael Slote has noted that the concept of social justice is seemingly an impossible notion to incorporate in the original versions of virtue ethics, as the ancient Greeks did not concern themselves with such notions (Slote, 2010, p.486): nevertheless, he ventured that modified forms of virtue ethics may be able accommodate such a concept by widening the notion of citizenship further than the limits that Aristotle accepted (Slote, 2010, p. 486); which today and in this work, would include accepting women and the non-propertied as citizens.

could not be relied upon as a regular source of energy by anyone outside of a household.

To solve this problem, the aforementioned publicly harnessed energy may be expected to fill the breach. However, it should be noted at this point, that the establishing of effective social justice, other than the common meals mentioned by Aristotle, has already been suggested by the commentator Martha Nussbaum. In her article entitled "Aristotelian Social Democracy", she concluded that the ideal Aristotelian society would be one where "no citizen would be lacking in sustenance" (Nussbaum, 1990, p. 204).

Here, if Nussbaum's notion is followed and it is considered that energy sustains an individual's status as a citizen, then all should have access to adequate energy. Also, by interpreting common meals as a benefit to the poor, then society should provide energy to the energy-needy. Furthermore, by applying the virtue of moderation, it may be expected that all have the right to enough energy to allow them to live moderately.

Finally, when recalling how a city state's common land funded religious needs and aided social bonding, in a similar a manner, some community services requiring energy may be provided by society, and this may increase levels of fellowship. All could take a civic pride in ventures such as street lighting and public transport; and of course, all would physically benefit from these services to various degrees.

Here, society would be the major player in supporting social justice by ensuring that all citizens interact on an equal footing in having access to moderate amounts of energy. A sense of fellowship would also arise with the publicly harnessed energy fuelling community schemes. Some bonhomie would arise from the limited amounts of energy that would be generously shared, and although this would be expected to be more than a token gesture, society would be the lynchpin that assures social justice.

3.2. Group rights

It has already been noted above that group rights must be considered for a range of reasons. But it should also be noted that a household is a group: the most basic of groups. Hence, it may seem at first glance that Aristotelian thought intrinsically supports groups: although it will be explained how his reasoning becomes less likely to support groupings as they become larger.

Focusing upon groups consisting of a several households, virtuous thought would seemingly support such entities. If the representatives of households are habituated in a universal mode of behaviour, then they would be expected to act virtuously in their interactions, and it follows that a group of households voluntarily assembling could easily share any energy produced. To demonstrate further, a group of households could agree to pool resources and invest in a water turbine placed in a nearby stream and store the energy in a battery. In seeking moderation, a household's representative could be expected to assess how much energy was required by her own household and appropriate this amount. The group could also be generous to visitors, who would be free to utilize energy from the store. Overall, it would seem that a virtuous distribution of energy would be able to exist within groups of households.

However, it would appear that virtuous thought would be confounded in larger projects, such as a shared hydroelectric dam for example. Here, some households may inadvertently take more energy than they need for two main reasons: firstly, although households may consider themselves to be taking moderately, excessive usage of energy may be masked by an averaging process which makes all appear to take moderately; secondly, seemingly abundant supplies of energy may reduce a household's awareness that they are behaving immoderately, and they may unintentionally take more energy than they need.

Of course, any excessive usage could be remedied by the introduction of record keeping and rationing, although this would tend to negate the Aristotelian spirit of exercising *phronesis*. Moreover, if an enterprise grew so large that it became either essential or detrimental to the running of society, then it should really be governed by societal rulings (Aristotle, 1980, p. 147 & Aristotle, 2000, p. 157). Hence, as a group grows larger, it would become society's concern.

However, Aristotle had an aversion to communally owned property and provided many reasons to avoid it. For example, he maintained that communally owned property discouraged persons taking pride in property, as they presume that another would be available to maintain the property instead (Aristotle, 2000, p.57), and he also noted that the industrious may resent those who do not work as hard on common projects where the rewards are not in proportion to the effort expended (Aristotle, 2000, p.61). Overall, the household following the Aristotelian spirit should avoid communal projects wherever possible.

Overall, Aristotle's work only really provides a template that is viable for the smaller groups: such as single households and a few households sharing a similar mindset. Moreover, the larger a group becomes the more likely it will be subject to society's rulings. Hence, group rights to energy are considered to be partially addressed by Aristotelian ownership.

3.3. Domestic harnessing

It was noted earlier that domestic harnessing provides a slew of benefits in addition to the general concept of gaining energy via renewable sources. Here, it is explained how Aristotelian thinking would embrace domestic harnessing.

Following the spirit of Aristotelian household management, a household would privately own the buildings and the attached surrounds. However, it follows that a household would now own the latent renewable energy held by or contained within its buildings and surrounds.

As gaining such energy domestically is increasingly viable this allows the Aristotelian emphasis upon both self-reliance and moderation to be exercised. In addition, a household can anticipate providing energy to others as an act of generosity, where enough energy is available.

Overall, as an availability of renewable energy is a natural consequence of household ownership, it should not be surprising that Aristotle's view of living well, based around the ownership of a household, would easily accommodate the domestic harnessing of renewables.

3.4. Sustainability

It has already been noted that a move to using renewable energy would be environmentally improving, but it should be noted that Aristotelian thought can embed the sympathetic value of sustainability and make an Aristotelian ownership model attractive to the United Nations or other bodies wishing to preserve the Earth's resources.

Discouraging excessive usage of the Earth's resources could be one result of the moderation gained from an habituation process favoured by Aristotle. Even where more energy is readily available, if harnessing more energy did not encourage living a virtuous life then it should remain unharnessed and virtuous individuals would refrain from gratuitous harnessing: hence, equipment would be used sensibly and

have a longer lifespan. Accompanying this, virtuous persons would not be expected to hold an excess of equipment. Overall, the corollary of enacted moderation would be that the rate of usage of the Earth's resources would be tempered.

In addition, dependent upon how rigorous the habituation process was, persons may be inclined to mend, reuse, and recycle material, and the virtuous person may ask herself, can I get this turbine mended? Would a recycled wind turbine be adequate? If a culture emerges where repairing harnessing and storing equipment becomes the norm, then this would further reduce pressure on the Earth's resources.

As renewables are introduced, this provides an opportunity to encourage a culture of moderation with regard to the purchase and usage of harnessing and storing equipment. In turn, this should lessen the pressure to use resources and contribute to sustainability.

4 Some queries concerning the practical introduction of the Aristotelian-influenced approach

This section describes how the Aristotelian-influenced approach may be introduced in society. It notes how the Aristotelian mindset may be supported by a society's laws, then describes how the approach may be introduced in industrial societies and closes noting how this may occur in developing societies.

It has already been noted that Aristotle favoured an habituation process which instilled virtuous behaviour (Aristotle, 1980, pp.270-2) Moreover, if the habituation process were successful it would culminate in the forging of a prevailing mindset in society. Hence, we should expect to see a whole society actively defining their own domestic energy needs and harnessing renewables accordingly.

However, Aristotle also recognized that individuals could behave very differently: and as a consequence, some may even choose to reject a prevailing mindset. Bearing in mind that some persons would stray from the virtuous path, Aristotle would wish for the whole situation to be safeguarded by law (Aristotle, 1980, p.271). He considered both written and customary laws to be acceptable (Aristotle, 1980, p.272), although custom was considered superior having withstood the test of

time (Aristotle, 2000, p.140).[15] Hence, the rule of law is here considered to safeguard virtue.

From this base, laws could act predominantly as deterrents to encourage compliance with the Aristotelian spirit. For instance, if some citizens were not gaining enough energy from within their own household, then they may appeal to the law. If their household distribution of energy was found wanting, then society could order their household to produce more energy and enact a different pattern of distribution within the household. When a precedent had been set, it would hopefully encourage errant households to comply.

However, if households did not respond to deterrents, then more severe punishment may be reserved for extreme behaviour. For example, those households who refused to harness renewable energy and instead solely relied upon the generosity of others, may be considered to be stealing and suitable criminal proceedings may follow.

But the question remains as to how equipment may be *physically* introduced in society. Ideally, householders steeped in the virtue of self-reliance should see the benefits of renewable energy and willingly purchase the apparatus they need: but as renewable energy is likely to become a concern that society thinks is essential to its continuance, it is likely to be subject to specific societal rulings (Aristotle, 1980, p. 147 & Aristotle, 2000, p. 157). A possible way of introducing the necessary equipment, under society's auspices, will be explained over the next few paragraphs, and it identifies three instances being: households who do not need assistance; households that should be initially supplied with harnessing equipment; and households that should be gifted publicly harnessed energy.

Many households may be considered to already have their renewable energy needs fulfilled; or have the capacity to fulfil these. For instance, wealthy households may be deemed as those who do not need assistance, and society may argue that it has provided an environment in which such households have flourished. Such households may be expected to purchase and maintain their own harnessing and storing equipment.

15 This work does not privilege written law over custom, as differing societies may prefer one to the other. That said, it is recognized that as renewables are a new technology, written law may prove to be more apt in dealing with the novel situations such as: codifying health and safety regulations; codifying building standards; preserving ecosystems; preserving culturally important sites; ruling upon clashes of interest; and ensuring that any necessary equipment contributes to sustainability via a longevity of usage.

However, there may be other households who are capable of harnessing their own renewables who cannot afford the initial cost of installation. Here, to enable such households to enjoy renewables, society may supply the necessary apparatus: this may include harnessing and storing equipment, but also energy efficient devices and insulation. Society would define how this should be arranged, and households may be furnished with the necessary equipment. The debt to society may be repaid in anyway this has been agreed; although noting Aristotle's aversion to usury (Aristotle, 2000, p.46), the debt may be repaid in kind.

It has previously been noted, when attaining social justice, that the energy-needy, or households who *cannot* harness energy themselves by any possible means, may be gifted energy from publicly harnessed facilities. But more detail of how this would come about is now needed and it should be expected that, the citizens who benefit from such an arrangement, by being raised in a virtuous environment, would be expected to define the moderate amount of energy that they need. It may be most efficacious to supply their energy via a grid system; although, once more, it should be noted that the situation may also be facilitated by assisting such persons in insulating their homes and purchasing energy efficient household goods. Hence, some centralized energy provision for households may remain in the Aristotelian-influenced model.

With many households harnessing their own energy, some may fear that an over-capacity in energy production may arise. However, with some forethought, the correct combination of equipment, would allow a household to only fulfil its needs. To explain via a simplified scenario: in sunshine, most energy may arise from solar power and the excess may be stored; in windy weather, most energy may arise from wind turbines and again the excess may be stored; and when renewable energy is unavailable, the energy stored may be retrieved. It is this arrangement that could be applied from those with large homes to those with modest homes alike: those living in rented apartments could feasibly hang solar panels from their windows, accompanied by small wind turbines fixed to outside walls, with the energy stored via a battery or even fed into a grid system for later retrieval.

At this point, some may say that those with more modest homes would be precluded from enacting generosity. Certainly, such smaller households could cater for their own needs but, it may be more difficult for them to harness extra energy. This would be a foible of domestic harnessing and it should be understood by all citizens, that households

should be generous wherever possible. Moreover, it would be churlish for the larger households to bear a grudge here, when their own generosity is attained by merely leaving their harnessing equipment running for longer, and has not really cost them any effort or expense.

Also, there may be those who correctly realize that there would be households who do not have the opportunity to harness enough energy domestically. Such households may consist of small apartments in shady, wind-free localities; without enough temperature differentials available to make it worthwhile installing heat pumps. To satisfy the energy requirements of such households it is envisaged that some commercial production would remain.

However, with a multiplicity of harnessing sites, there may be those who would fear an inefficiency associated with domestic energy provision when compared to centralized generation. Here, it should be noted that a major inefficiency in centralized generation has been the loss of energy during transmission due to electrical resistance in cabling; estimated at 5% of energy generated within the United States (U.S. Energy Information Administration, 2023). Renewables, such wind power, and solar radiation, where energy is brought directly to the site of harnessing, would not experience such a loss. Moreover, discussions of efficiency need not be a significant topic for debate when renewable energy is an unlimited resource.

Additionally, Aristotelian-inspired ownership would require cooperative governments for it to be feasible, and there are some forms of government that favour centralized control over many aspects of citizens lives. However, it should be noted that beneficial technology has a tendency to introduce itself into society,[16] and decentralized renewables are a technology that can be currently regarded as following such a path: in short, new harnessing and storing technologies are constantly being developed, reducing dependence upon a central supply, with energy users becoming accustomed to gaining their own energy. Hence, there would seem to be an inevitability that domestic harnessing will effectively establish itself.

Against this, supporters of centralized generation may contend that it has a proven record of providing taxation revenue; that fund important services such as healthcare and education. To which it may be argued

16 Geels and Schot provide a generalized description of this process, analysing differing stages whereby beneficial technology may be introduced (Geels & Schot, 2007, pp. 399-400).

that society already has enough opportunity to gain revenue via income taxes, corporation taxes, sales taxes, and excise duties from goods other than energy. Hence, governments may return to a taxation base similar to that established before the introduction of centralized energy supply.

Some may add that the contribution made to sustainability, from virtuous living would be seriously mitigated by the pollution caused during the manufacturing of harnessing and storing equipment. Firstly, the equipment may require manufacturing methods that pollute the atmosphere, and this will unfortunately remain true until enough clean, renewable energy is available to manufacture such equipment. However, by comparing the pollution saved from being emitted when using the new equipment, to that emitted by generating energy via the old methods, a cost-benefit analysis would note that the use of harnessing equipment over a period of time could offset any detrimental aspects associated with its construction.[17] Hence, the key to introducing carbon-neutral harnessing and storing equipment will be to ensure that such equipment is built to last many years; which would be aided if the equipment is both repairable and recyclable.

It has previously been noted that there is an expectation that the harnessing of renewables will spread globally, but this would have a cost, and an Aristotelian–inspired ownership type may seem, at first glance, to be the preserve of developed nations. Some may then ask, how can developing nations possibly afford to partake? Some may assert that, even if many currently developing societies lie in the tropics and receive more solar radiation than many developed countries, that lie in more temperate latitudes, it would take movements of capital from wealthy societies to the developing world for an Aristotelian-inspired distribution to take root; which may prove to be too great of a sacrifice for the taxpayers of wealthy societies. However, it should be noted that a successful transfer of goods is currently ongoing without any real sacrifice being made by the wealthier regions and two types of transfers are now demonstrated: firstly, transfers that require no direct financing; and secondly, transfers that would require relatively large investments.

17 If a sustainable renewable energy source produced 0 units of damage to the environment for every kWh of electricity produced and average conventional sources produced x units of such damage, then, after the renewable source has produced a million kWh of electricity, x million units of damage have been prevented. Moreover, if the renewable energy source required x million units of damage during its construction, then it effectively "breaks even" with regard to damaging the environment, and after this, its usage should contribute to notions of sustainability.

Firstly, some developing societies are allowing the marketplace to supply renewable energy needs (Jackson, 2015). To this effect, industrialized nations may produce the equipment that can then be transported to developing societies where households may purchase it. An example may be provided by small solar panels sold in many sub-Saharan African societies where much of the populace may be described as "off-grid". It should also be noted that these transactions have cost the industrialized societies nothing if sales recoup all costs.

An example of the second type of transfer is provided by Bangladesh which received financing from the World Bank to supply solar panels for home usage (World Bank, 2014). Bangladesh will repay the loan over a forty-year period, and therefore aid offered to developing societies need not be as costly as many in industrialized societies would initially anticipate. Hence, organizations such as the World Bank that do not require an immediate return on their capital have their role to play.

5 Some criticism of the Aristotelian-influenced approach

The application of Aristotle's thinking to the ownership of renewable energy would expect to garner criticism from other theoretical perspectives, and some are now aired.

The theory demonstrated above, may be criticized on the grounds that it is a political philosophy relevant only to bygone times. Aristotle's notions of household management were potentially based upon enslaved labour, and no modern political philosophy would wish to associate itself with such practices. However, it should be noted that in the modern age, harnessing and storing equipment should be installed by paid employees; and after this, the produce of renewable energy, should only be gained by employing the equipment. The exploitation of human beings should not occur.

Some may claim that the introduction of Aristotelian thought may be too much of an upheaval for established societies. Such persons should be reminded that only one area of life, namely energy provision, is the focus of attention here. Other areas of life would continue unhindered, and it is possible that a virtuous energy regimen in households could be grafted on to both liberal and socialist societies, as two examples, without necessarily assailing the remaining structure of such societies.

Others may ask, is it good practice to use an author's work and apply it to concepts that the author could not have anticipated? Such critics should remember that this is a work of "applied philosophy" attempting to define a practical ownership type for renewable energy: therefore, it should be free to use any relevant areas of an author's work in tackling its goals. Moreover, the object here is to apply the spirit of Aristotle's work and the ownership type presented only claims *influence* from Aristotle.

But the question then arises, would it be possible to apply the spirit of other political philosophies to the problem at hand? For instance, libertarianism, may at first glance seem to provide a suitable ownership type, as it would concur with the proposition of looking after one's own interests by owning one's own harnessing and storing equipment, and benefitting from its produce.

The problem with some forms of libertarianism, and Robert Nozick's theorizing is cited here as one example, is that it fails severely in satisfying a notion akin to social justice, and therefore cannot be contemplated as an ownership type according to the attributes required here. Although he felt that the vast majority of persons would voluntarily strive to alleviate societal problems (Nozick, 1974, p.267), if a shortage of energy became a problem in society, there is no certainty that a benign distribution would occur as people would not be compelled to help others via donations from their own store of energy. In contrast, using their judgement, the citizens of an Aristotelian society would be expected to be more generous where a dearth of energy arose. However, if energy was considered vital for a person's wellbeing, then it is possible that some compensation could be arranged for those falling on hard times through no fault of their own (Nozick, 1974, p. 178 & pp. 180-1); but again, there is no guarantee that this would approach the levels of energy required by a notion such as social justice, and a libertarian society tenaciously supporting private property would have no safety net derived from publicly harnessed energy.

Although some philosophies may fail to provide a suitable ownership type, they may still be expected to sternly query Aristotle's model. For instance, staying with Nozick's libertarianism, its advocates may immediately focus upon the virtue of moderation, and question its legitimacy; believing that the principle of unrestricted production would benefit a society overall (Nozick, 1974, p. 228). They may ask, why can't the most productive households harness without limits if they desire more energy?

Surely, their desire for more goods, powered by this extra energy, would stimulate an economy and all could indirectly benefit from this increased productivity? Additionally, if renewable energy's introduction is inevitable and it is overwhelmingly important to establish renewables, then why not let persons freely harness renewables unhindered?

Certainly, where the introduction of renewables is imperative, then it is possible that some societies may attempt to introduce them by allowing *laissez-faire* to operate: recalling the above example of sub-Saharan nations, it is noteworthy that some governments have forsaken sales taxes to encourage the proliferation of such goods (Jackson, 2014). Hence, some benign libertarian thinking may initially be beneficial when allowing renewables to establish themselves. That said, when renewable energy sources have been established, the advantage of Aristotelian thinking is that it should contribute to providing a more cohesive society by embedding a form of social justice.

Also, for libertarians, exercising the virtue of generosity may seemingly license an appropriation of others' property: for them, it may seem that property owners are effectively forced to allow others to benefit from their assets when their harnessing equipment supplies others with energy. Libertarians may attempt to strengthen their position by arguing that a person should be "entitled to" whatever they have produced with their talents (Nozick, 1974, p. 225): effectively, one's produce becomes an extension of oneself over which one has full rights; and it follows that one is free to dispose of one's harnessing equipment and energy as one wishes. However, the Aristotelian-inspired mindset would operate with persons keen to allow any spare capacity to benefit others, without the energy providers feeling that their rights had been infringed.

However, an exception may be made for those who were initially gifted their harnessing and storing equipment by society and are now paying off the installation costs. Such households may be inclined to sell excess energy to repay their debt to society and a virtuous person would be expected to be understanding here, as some refrain from enacting generosity before they are in a position to gift excess energy to others.

The libertarian may be further troubled by the extensive presence of a virtuous mindset and from a Nozickian viewpoint, the imposition of such a mindset would treat individuals as "means" with the ultimate "end" being the establishment of a virtuous society: a notion that would offend the Nozickian's subscription to Kantian values (Nozick, 1974, p.32). The advocate of virtuous living would remind such critics that a

society based upon libertarian theorizing would instil its own the "end", in the form of a libertarian *ethos*.[18] Hence libertarian society may be as culpable as using persons as "means".

Moving to look at the far left of the political spectrum, an Aristotelian-inspired ownership type can expect a mixed reception. Some Marxists may welcome the advent of the small-scale harnessing of renewables: they may envisage the combination of acquired knowledge and improved technology, which comprise the "productive forces", breaking through the established "economic structure" to start a new historical epoch.[19] Here, some may witness this occurring with harnessing and storing equipment becoming cheaper and more popular, with the result that all may enjoy domestic harnessing. That said, Marxists may not hold identical viewpoints, as some may wish for collectivized ownership and they may argue that awarding rights to a household, primarily based upon property ownership, encourages isolationism and the pursuit of self-interest (Marx, 1844, pp. 107–8). Some may fear households secretively guarding their own holdings of energy and limiting the amount that would be availed to others. Therefore, not all Marxists would be expected to advocate domestic harnessing.

In addition to Marxist critics, those of a communitarian or egalitarian bent, may claim that an *improvement* over other energy supplies should not be considered to be adequate when renewable energy is widespread and unlimited; in short, they may argue that the move to renewables provides a chance to remove any notion of "need" within energy provision and provide an area of life with perfect equality. In particular, the Marxist would note that a virtuous life may not give "to each according to his needs" (Marx, 1875, pp. 540-1), as many may be expected to settle for a moderated existence without recognizing their true "needs". In response, once more, the Aristotelian would expect that the presence of a virtuous mindset would mean that all would wish for a moderate existence and therefore no one would experience suffering due to their level of energy usage.

With regard to criticisms from liberals, Rawlsians as an example, may claim that the habituation process would constrain both individuals' ability to make life-choices and their faculty for self-understanding

18 Where an *ethos* may be defined as: "The characteristic spirit of a culture, era, or community as manifested in its attitudes and aspirations" (Oxford Languages, 2025).

19 Expounded by Wolff and Leopold and based upon Marx's 1859 preface to his The Critique of Political Economy (Wolff & Leopold, 2025).

(Rawls, 1999, pp. 392-4). Countering this, it may be argued that these personal aspects would continue: life-choices would be made with a lesser amount of energy available, causing persons to consider their options more fully. As an example, persons would consider the opportunity cost of purchasing electrically powered goods that use similar amounts of energy: such as a drone or a scooter. With greater amounts of energy available a person may be tempted to purchase both items and find that one item remains largely unused. Hence, greater self-understanding may arise based upon deliberation rather than experience.

Moreover, liberals may claim that the virtuous society would not produce enough energy to facilitate economic growth. Certainly, it is true that under a virtuous regimen, households would act to moderate energy usage. However, if economic growth was needed, the sector of society dealing with commercially produced energy, generally laying outside the realms of households, may be expected to step into the breach.

6 Conclusion

A combination of factors would recommend the Aristotelian model for the ownership of renewable energy. It fully addresses the provision of domestically harnessed renewable energy. In addition, it supports group rights for the smaller groups. Furthermore, it would promote sustainability by firstly limiting energy usage and further reducing the amount of raw material used. It would also provide a form of social justice although society, as opposed to households, would have a greater contribution here.

All of this would be attained by enacting the virtues of self-reliance, moderation, and generosity. These virtues would be staunchly upheld by the majority of the populace and acquired from an upbringing entailing an habituation process that would instil a supportive mindset. Moreover, the requirement to adhere to such values may be safeguarded by law; primarily guiding behaviour but providing punishments where necessary.

Overall, after applying Aristotle's theorizing, an answer may now be provided to the question posed at the start of this work: *who owns renewable energy?* If most energy in a society was needed domestically, then households would own most of the energy. However, society would remain a major energy owner when maintaining social justice.

That said, Aristotle's thinking provides an ownership type that may be attractive to families or individuals living in households; although it could feasibly stretch to providing energy to a few households. Hence, it may be particularly suited to societies that favour their populace living in self-contained homes but could also cater for small communities.

Overall, an application of Aristotle's work as an ownership type, when put into practice, may offer one route for developing future energy policy within a society. Hence, it should be considered as one way of facilitating renewable energy's necessary, global introduction.

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