



REDEFINING SUSTAINABLE AND RESPONSIBLE INVESTING

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Redefining Sustainable and Responsible Investing

The next global economy is emerging in a new world full of unprecedented technologies, new ideas about resources and capital, and new approaches to business. Crucially, we are also being confronted with environmental and economic challenges never before imagined. The 'next economy' or 'green economy' approach to investment management asserts that the basics of the global economy are evolving in tandem with these changes and that methods of investment management must evolve with them. Green Alpha Advisors contemplates a future economy in which the next generation of asset management must be integral to and reflective of that next economy which both functions to support the integrity of earth's systems and also can function within earth's tolerances and finite resource base.

To appropriately invest in this emerging, green economy, one must appreciate that the next economy is by definition not the legacy economy of previous generations, and that it therefore requires a new understanding, new definitions and a new set of rules. To some degree, this requires redefining the parameters of modern portfolio theory to reflect this new world with its technologies and challenges. This in turn requires new economic models, new portfolio construction methods, and new sector classification schemes. Green Alpha Advisors approach to all three is presented here in brief.

Next Economy Identification and Transition

The next economy approach involves modeling what a near-future, growing, sustainable economy might look like, and then building portfolios of companies that are already focusing capital, time, energy and deliberate thought on the solutions to the world's key climatic-macroeconomic issues. These issues are: mitigating climate change, improving public health, minimizing future extreme weather events, achieving greater use of our national and global production capacities (and their resources), expanding economies, and shrinking deficits.

These solutions, fortunately, largely exist today and others will continue to emerge as applied science advances. But even with recent growth in popular and practitioner awareness of these technologies and techniques, we can't help but observe that the dangers of our enviro-economic situation remain underestimated overall, as evidenced by continuing denial of climate change in some influential quarters and the enthusiastic support at the highest business and political levels of massive new development of fossil fuel resources (such as widespread natural gas hydrofracturing and development of Canadian tar sands for oil).

In assessing the risks, we share the view of Christine Lagarde, Managing Director of the International Monetary Fund and former finance minister in the conservative French administration of Nicolas Sarkozy, who recently stated, "[i]ncreasing vulnerability from resource scarcity and climate change, with the potential for major social and economic disruption: This is the real wild card in the pack...the greatest economic challenge of the 21st century." (In prepared

remarks at the World Economic Forum at Davos, 2013¹.) Challenge of course, presents opportunity.

Our belief in economic opportunities within the 21st century rests on a simple premise: as popular awareness of the magnitude of climate change, severe weather, resource scarcity and population growth advances the technologies and means of doing business represented by firms in our next economy portfolios will become the objects of ever increasing investment and client patronage.

How then does a transition from the legacy economy to the next economy occur? Begin with a high-level definition of a next economy firm: next economy companies are market leaders both in adding economic efficiencies and responding to the challenges presented by a warming, increasingly populous, resource-constrained world. Through technology and innovation, these companies have potential to deliver strategic growth via opportunities most crucially in but not limited to transportation, communications, commerce, infrastructure, materials, energy, agriculture and water.

That definition in hand, one may further define the next economy in aggregate as comprised of enterprises that:

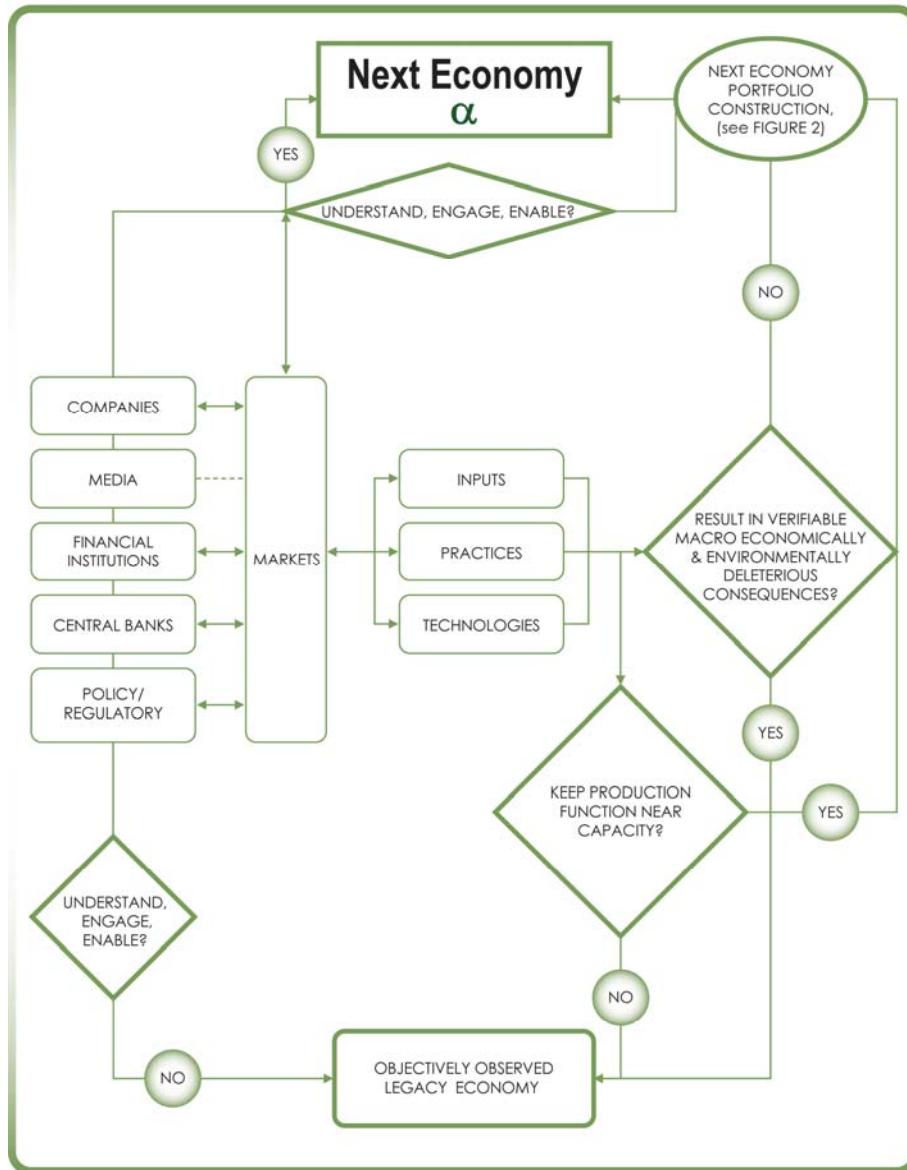
1. are powered by energies and use material inputs that have not had demonstrable deleterious impacts on global economic underpinnings (be these macroeconomic or basic environmental); and
2. present better-than-legacy economy opportunities to keep national and international production functions running closer to their capacities than has recently been the case, or than is likely to be the case under legacy fossil fuels economies.

Both of these conditions are crucial; the first helps secure the basic environment necessary to have an economy: adequate resources, reasonably mitigated climate change, potable water, sufficient agricultural output, etc. The second drives continued economic growth.

Necessarily, though, these conditions and their formational goals require recognition from all engaged quarters: financial institutions, central banks, policy makers and regulators, the financial and popular media, and companies themselves. We believe this transition is inevitable over the long run, whether aided by forward looking investors, professionals, policy makers and academics actualizing it in the near future, or whether forced upon us by dramatic climate and scarcity-related events. Figure (1) presents a graphic representation of the economic transition.

¹ <http://www.theglobeandmail.com/commentary/roasted-toasted-fried-and-grilled-climate-change-talk-from-an-unlikely-source/article8077946/>

Figure 1: Model of Next Economy Identification and Transition



Leaving climate momentarily aside and addressing the second condition necessary for next economy transition, we assert that next economy economics, properly applied, can also counteract underused economic capacity, thus spurring both demand and growth. Underused capacity of course results partly from inadequate demand, from which the global economy is currently suffering: Europe is contracting, Japan is stagnant, the U.S. is experiencing growth, but thus far it is paltry. Austerity is globally crushing demand and so production and so jobs and so, circularly, both production and demand. Next economy economics addresses these limitations on several fronts, first with truly renewable energies.

If energy, as it now finally has the potential to do, becomes in practical terms limitless and far less costly, economies will have been unburdened of their single largest drag, and trillions of dollars could be liberated over time. This is far from impossible. We now know that solar and wind at scale can generate all the energy civilization will ever require, and, once entrenched, will do so at nominal continuing fixed. This previously unimaginable scenario is within our technological grasp to make real: zero cost of fuel for all the energy we will ever need. But renewable energy is far from the only next economy accelerator of economic production and means of capital conservation.

Waste-to-value economics also could unlock enormous quantities of capital that presently are sequestered everywhere from landfills to oceans. To provide just one “waste to value” example, Trex Company, Inc. (TREX) is the world's largest manufacturer of high performance wood-alternative decking. We consider Trex a prime example of waste-to-value economics that not only keeps huge quantities of waste out of landfills and oceans (Trex used 3.1 billion plastic bags in 2010, participates in a system responsible for 70% of all U.S. plastic bag recycling, and has never harvested a single tree to make its product²), but also delivers a superior product with better long term value. In a world of constrained resources, making great stuff from leftovers is the best of all worlds, increasing production without using additional primary resources and increasing demand by keeping people thus employed.

Next, mitigation, via far more efficient irrigation, water management, farming and soil conservation technology and methods, of key resource scarcities in water and food has two material economic benefits. The first is simply that avoiding scarcity situations means prices are stabilized and resulting economic drags and disruptions are thus avoided. Second, minimizing scarcity in basic needs heads off social and political strife which otherwise would severely depress production and demand in affected areas. Consider places where food and water scarcity are already critical. In Somalia, there is little to no production capacity left. Demand, such as it is, is increasingly being met by non-production enterprises such as piracy. In aggregate, the world is now in food supply terms living year to year ³(Lester Brown, Earth Policy Institute, 2013); 2012 saw grain consumption far exceed production and stores drop to an all time low. Far better resource management is required to prevent more and more nations from following Somalia's devastating course.

² <http://www.trex.com/plan/why-trex/environmentally-friendly/green-facts/index.htm>

³ http://www.earth-policy.org/book_bytes/2013/fpepch1

Summarizing, we believe the three next economy drivers of growing future economies under new world conditions are limitless clean energy, waste-to-value economics, and constantly improving resource management, particularly in water and agriculture.

To return to the first condition necessary to construct a next economy (minimizing deleterious environmental effects), it's now clear that the reality of global warming fundamentally touches all factor areas so far discussed. For a more complete review than the scope of this paper allows, see Coral Davenport's compilation of what we now know about the economic effects of climate change in a piece for the National Journal (February 8th 2013⁴).

Investing in fossil fuels presents a particularly devious feedback loop. "The benefits to the [fossil fuels derived] energy supply deteriorate at the same time as the collateral damage to climate (in the form of increased carbon dioxide emissions per barrel of oil produced) goes up." (Pierrehumbert, Slate, February 6th, 2013⁵.) This can be viewed as fundamental to the case that transition to a global next economy footing is ultimately not optional, and is discussed in detail by the International Energy Agency in their World Energy Outlook ⁶(2012). A truly sustainable next economy portfolio therefore must eschew fossil fuels altogether.

To be clear, all discussed economic impacts are here now, and they're going to get worse, incrementally (and not so incrementally) destroying value year by year until we achieve a fundamental transition to a global macro production function that rests both on sustainable energy and sustainable, more circular material and capital inputs (both conditions 1 and 2). In their Politico essay "Climate Change is a Force Multiplier"⁷ (February 7th, 2013), Goodman and Sullivan note that the intelligence and military communities now take as given that the legacy economy and climate change are already disrupting global economic stability and have the potential to do far worse, lest we rein them in. It's not a coincidence the U.S. military is among the institutions deploying the most renewable energy in America (Pike Research, Renewable Energy for Military Applications⁸, 2012).

Next Economy Portfolio Construction Model

Having perceived the need for transition to the next economy, one must develop methodologies to practically apply these observations in meaningful ways. To accomplish that, we begin by discussing portfolio management as generally practiced today. Traditional portfolio management practices – largely developed and made canon in the 1930s and '40s and still in mainstream practice today under the general term 'modern portfolio theory' – were made for and unavoidably reflect a world where fossil fuels were the only imaginable primary power source, where there were fewer material resource constraints, a far lower global population, where the word 'scarcity' did not apply to the natural world, and no one had heard of climate change or global warming.

⁴ <http://www.nationaljournal.com/magazine/the-scary-truth-about-how-much-climate-change-is-costing-you-20130207>

⁵ http://www.slate.com/articles/health_and_science/science/2013/02/u_s_shale_oil_are_we_headed_to_a_new_era_of_oil_abundance.single.html

⁶ <http://www.iea.org/publications/freepublications/publication/English.pdf>

⁷ <http://www.politico.com/story/2013/02/climate-change-is-threat-multiplier-87338.html?hp=I8>

⁸ <http://www.pikeresearch.com/research/renewable-energy-for-military-applications>

Over the last couple decades, though, attempts to work within the traditional paradigm to make portfolios more environmentally and/or socially progressive have emerged. These may be broadly categorized into two methodologies, 'negative screening' and 'best of breed.' But each of these approaches has its own limitations that make each in its way inadequate to the task of next economy portfolio construction.

'Best of breed' (also known as 'best in class') methods, which seek to identify and hold the 'best' (meaning most green, most socially responsible, etc.) examples of companies from each sector (including oil and other deleterious industries) will prove insufficiently robust in addressing climate change and resource scarcity. This is because even the best companies from a given industry or 'breed' are hardly beneficial where that industry is creating negative environmental-economic conditions. Best of breed methodology is the investing equivalent of the Obama Administration's occasionally espoused "all of the above" energy rhetoric. When existing technologies have proven incontrovertibly deleterious, arguments to keep them in the mix of production function inputs - even if at somewhat lower portfolio weights - reflect inappropriate attachment to short term profits.

'Negative screening' criteria methodologies meanwhile represent the ethical equivalent of charting or technical stock analysis in that it provides a lot of information about a company's past, but in reality conveys very little information about a firm's future, or future exogenous events that may influence it. How does one create value from that data? What will historical data change? Negative screening and technical analysis charting focus on sunk data, rather than on prospective evaluation of enviro-economic mitigation applicability or likely scenarios for growth. Eschewing a company that may have been a responsible party to a Superfund site in the 1980s, for example, would prevent one from investing in a company such as Applied Materials (AMAT), which is now advancing the next economy on several fronts.

One does not have to look far to find mutual funds and separate accounts that market themselves as "sustainable" or "ESG" or even "green" that, due to desires to adhere to modern portfolio theory and therefore to hold all economic sectors, contain holdings such as Chevron (CVX; oil and gas), MDU Resources (MDU; natural gas and fracking), W&T Offshore (WTI; deepwater offshore oil exploration and natural gas), Denbury Resources (DNR; Gulf Coast oil and gas development) and many more across many industries.

Enough with the 'all of the above' and 'best of breed' rhetoric. Reality dictates that we massively reduce use of fossil fuels wherever there are practicable alternatives. Modern capitalism is faced with a decision between destroying the biosphere and other global economic underpinnings and evolving its rules, and thus far it's not clear which ideology will prevail. The macroeconomics of solutions via mitigation and adaptation seem like a high probability function factor for long term competitive returns derived from companies delivering next economy solutions. The alternative, equally deterministic, is that the human brain and organism is fundamentally wired in a way that will always seek to maximize immediate term benefits in a way not compatible with existing indefinitely in a finite world. To paraphrase FDR, one may not face in both directions at once. To invest for the future as though we could is paradoxical and will not result in a healthy future economy or, long term competitive returns.

And so modern portfolio theory must evolve to no longer require oil and coal investment. 'Make sure you have portfolio exposure to civilization's primary sources of energy that are required to power production.' In the past that could only mean fossil fuels. But the innovation that has occurred since then could allow us to power society as we know it (and much more), and do it all at a cost that could emancipate us to pursue the next great accelerando of human endeavor.

So, in a reversal of traditional models of asset management, our first step in portfolio construction is to begin at the highest macro level and make an objective assessment regarding the most pressing dangers confronting world economies via climate change and resource scarcity. Having identified these threats, the next step is to rigorously research scientific consensus and new approaches to the technologies, ideas and business practices best positioned and most likely to successfully aid in mitigation of and/or adaptation to the key threats. Of these approaches, then, we ask in the third step which can practically be deployed or practiced. Then, of the likely functional, practical approaches, we fourth ask which can also be aligned with economic interests such that they can attract market capital and inspire both entrepreneurs and established companies to engage. Only now, at this point, do we in our fifth step identify specific companies that come as close as possible to purely meeting these criteria.

Looking at granular company-level financial data is the final step in our process and is only applied to qualified next economy companies, as identified via the five-stage methodology briefly described above. In the final step then, we apply quantitative, rigorous, bottom-up financial analysis to identify stocks of next economy companies that we believe offer the best financial positions with minimized risk, with particular focus on growth potential and market liquidity and bankruptcy risks. The tools applied in this final step are universally known and practiced and do not bear describing here. And in any case this is not the piece of portfolio management we're redefining. Suffice it to say that from a bottom up fundamental perspective, we don't believe one can improve much on tried and true Graham-Dodd methodology.

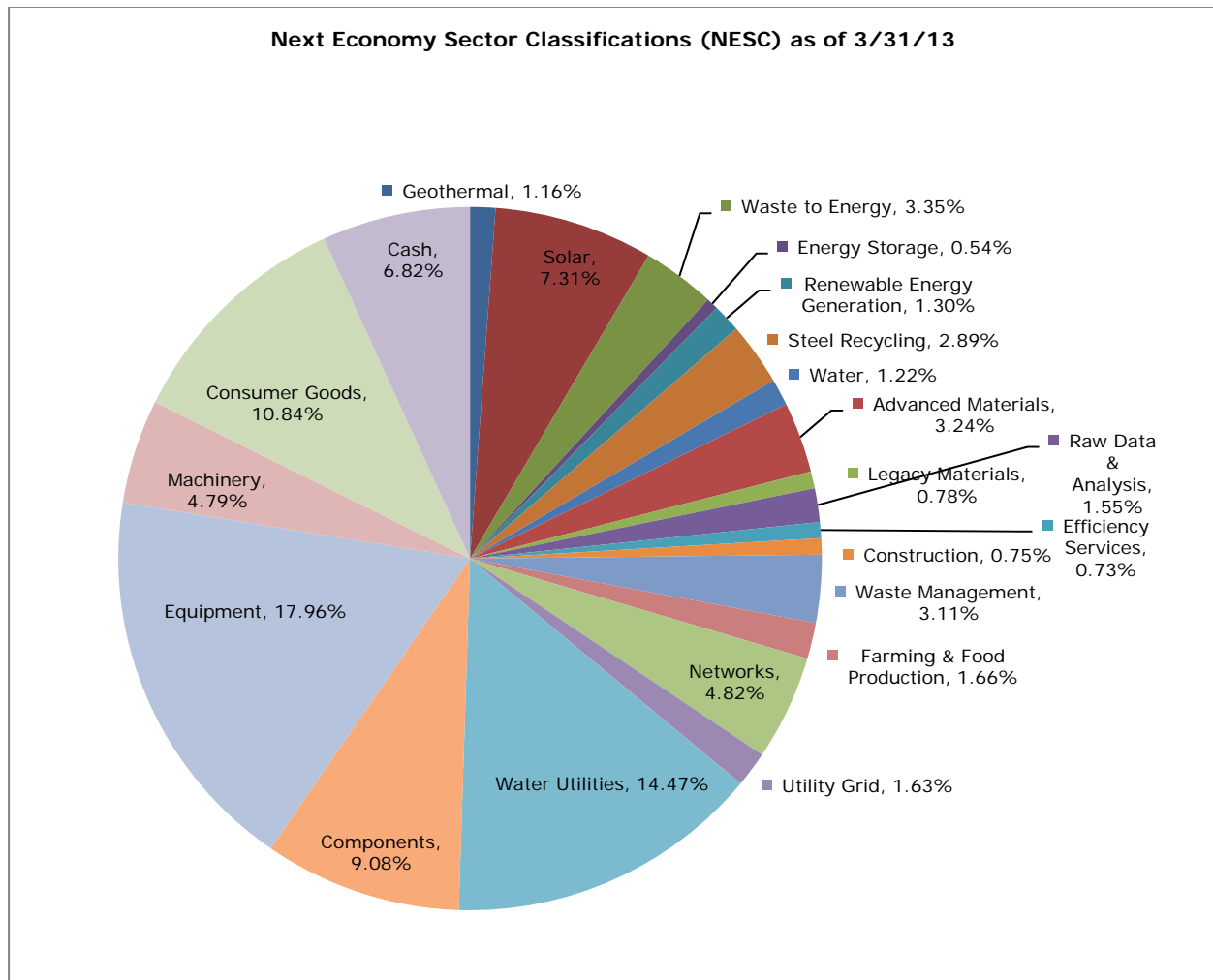
Figure 2: Next Economy Portfolio Candidate Identification Methodology



The six stages of our methodologies are represented by the above Venn diagram.

Next Economy Sector Classification

Finally, redefining investment management paradigms necessarily means redefining sector classification schemata. Subsequently, we developed our own “Next Economy Sector Classification Scheme” (NESC) in 2008 to reflect the businesses and technologies in our portfolios in much the same way that the traditional Global Industry Classification Standard (GICS) was created by S&P and MSCI Barra to reflect their indices (such as the S&P 500).



Conclusion

Sustainability, on a global macroeconomic level, isn't so much a choice as a requirement. As the World Economic Forum put it⁹, "On the economic front, global resilience is being tested by bold monetary and austere fiscal policies. On the environmental front, the Earth's resilience is being tested by rising global temperatures and extreme weather events that are likely to become more frequent and severe. A sudden and massive collapse on one front is certain to doom the other's chances of developing an effective, long-term solution." (Global Risks, 2013 – Eighth Edition.) Not that any of this is easy or immediate. As much as we might wish otherwise, "pathbreaking creativity requires many years of acquiring a deep knowledge base from which you can draw to make novel connections" (NYU Adjunct Professor of Psychology Barry Kaufman, 2013¹⁰), and evolving new methodologies is a slow and painstaking process.

But we have to make the effort, because it's clear to us that we're in for a hard landing both economically and environmentally (to the degree that the two can still be disambiguated) if we don't use what's left of our fossil-fuels era prosperity and excess resources both to develop new and to deploy existing technologies and innovative business practices to secure a worldwide production function that is powered by limitless clean power and supplied by indefinitely sustainable material inputs. Building portfolios as if that future was already upon us – and perhaps it is – remains the clearest path that we can see to long term competitive capital gains for ourselves and for our clients.

Top 10 Holdings Shelton Green Alpha Fund (NEXTX) as of 3/31/2013	Ticker	% of portfolio
Google Inc	GOOG	4.40%
Companhia de Saneam ADR	SBS	3.80%
United Natural Foods	UNFI	3.80%
American Water Works	AWK	3.70%
Covanta Holding Corp	CVA	3.60%
Honeywell Intl.	HON	3.50%
Johnson Controls Inc	JCI	3.50%
Tesla Motors, Inc.	TSLA	3.40%
ABB Ltd. ADR	ABB	3.40%
Darling Intl.	DAR	3.30%

⁹ <http://www.weforum.org/reports/global-risks-2013-eighth-edition>

¹⁰ <http://blogs.scientificamerican.com/guest-blog/2013/02/05/the-virtues-of-a-cognitive-workout-new-research-reveals-some-neurological-underpinnings-of-intelligence/>

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Green Alpha Advisors environmental focus may limit investment options available to the Fund and may result in lower returns than returns of funds not subject to such investment considerations. There are no assurances that the fund will achieve its objective and or strategy.

Investing in securities of small and medium sized companies, even indirectly, may involve greater volatility than investing in larger and more established companies.

Fund information is not intended to represent future portfolio composition. Portfolio holdings are subject to change and should not be considered a recommendation to buy individual securities.

Investors should consider the Shelton Green Alpha Fund's investment objectives, risks, charges, and expenses carefully before investing. The prospectus contains this and other information about the fund. To obtain a prospectus, visit www.sheltoncap.com or call (800) 955-9988. A prospectus should be read carefully before investing. Investments are not FDIC insured or bank guaranteed and may lose value. Shelton Funds are distributed by RFS Partners, member FINRA and affiliate of Shelton Capital Management (4/2012).

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