June 1, 2018

Response to Request for Information from The Office of the New York City Comptroller

Investment and Fiduciary Analysis of Prudent Strategies for Divestment of Securities Issued by Fossil Fuel Reserve Owners

Responding Party:
Ian Simm, Founder & Chief Executive of Impax Asset Management Group plc.

Please contact David Richardson for all communications related to this RFI:
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I. Executive Summary:

Impax Asset Management ("Impax") is a leading specialist investment firm. As of March 31, 2018, Impax manages and advises on approximately $15.5 billion; primarily for institutional clients through both listed equity and real asset strategies. Impax's investments are based on the firm's strong conviction that capital markets will be shaped profoundly by global sustainability challenges, including climate change, pollution and essential investments in human capital, infrastructure and resource efficiency. Impax believes that these trends will drive growth for well-positioned companies and create risks for those unable or unwilling to adapt.

Impax has collaborated Carbon Tracker to respond to this RFI. Carbon Tracker is a leading independent financial research organization that carries out in-depth analysis on the impact of the energy transition on capital markets and the potential changes in investment in fossil fuels.

Impax is proud to have been an early signatory of the statement of support for the recommendation of the Task Force on Climate-related Financial Disclosures ("TCFD"). For nearly 20 years, Impax has endeavored to further investor understanding of both the direct physical impacts of climate change itself, and the associated regulatory risks resulting from financial exposure to companies with embedded carbon risk. In 2015, Impax was one of the first investment managers to develop a method of measuring carbon risk using a scenario approach to carbon pricing, an approach was recommended by the TCFD in 2017.

There is an increasing likelihood that governments of major economies will act within the next decade to reduce greenhouse gas emissions, probably by intervening in the fossil fuel markets. Impax argues that investors should model the financial impact of

this regulatory risk and replace their market-weighted basket of E&P energy stocks with a new energy basket that includes lower weightings of some E&P energy stocks with equivalent higher weightings in stocks of companies active in energy efficiency markets, thereby maintaining exposure to energy price factor risk.

Typical investor responses and Impax's approach
Asset owners and their advisers have typically adopted one of three approaches in responding to climate change risk. Those who ignore it are increasingly challenged by regulators' signals that this approach is inconsistent with fiduciary responsibility. Those who quickly sell out of fossil fuels need to ensure they are not adding other risks in the process. Finally, some asset owners prefer to continue to evaluate and delay making a decision, potentially waiting for improved analytical tools.

Impax recommends a fourth approach, which is to use scenario analysis regarding future climate change policy to estimate overvaluation in today's asset prices, and then optimize a standard equity portfolio to take account of this new information. The resulting portfolio maintains full exposure to "low risk" companies and partial exposure to those with "medium risk". The Systems would retain the ability to engage with management of these companies in order to encourage them to adjust their responses to carbon risk.

II. Responses to Questions:

A. General Information

1. Name and business address of responding party (if responding on behalf of a firm or organization, provide for that entity)

Name of Responding Parties:
Ian Simm, *Founder & Chief Executive of Impax Asset Management Group plc. in collaboration with* ***Mark Campanale,*** *Founder & Executive Director and* ***Henrik Jeppesen, CFA****, Head of Investor Outreach North America of Carbon Tracker Initiative, Inc.*

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2. **Website address, if available.**

   http://www.impaxam.com
   https://www.carbontracker.org

3. **Name, address, email address and phone number for single point of contact for all communications.**

   All communications should be directed to Impax Asset Management as follows:

   David W. Richardson, CFA (based in Metro New York Office)
   Executive Director – Client Service & Business Development
   d.richardson@impaxam.com
   802 343 1400

4. **Please briefly describe your occupational and professional status and background, expertise related to the issues in this RFI and any other relevant background information.**

   Ian Simm is the Founder and Chief Executive of Impax Asset Management Group plc. Ian has been responsible for building the company since its launch in 1998, and continues to head the listed equities and real assets investment committees.

   Prior to Impax, Ian was an engagement manager at McKinsey & Company advising clients on resource efficiency issues. In 2013 he was appointed by the Secretary of State (Senior Minister) for Business, Energy and Industrial Strategy as a member of the Natural Environment Research Council (NERC), the UK's leading funding agency for environmental science. He has a first class honors degree in physics from Cambridge University and a Master's in Public Administration from Harvard University.

   Impax Asset Management Limited, founded in 1998, is a specialist asset manager focused on investing in the transition to a more sustainable global economy. Impax London offers a range of global equity strategies and real asset funds focused on the growth opportunities arising from this transition.

   Impax's investment professionals are engaged investors, in regular dialogue with companies in their portfolios and reporting on stewardship activities to clients. Where possible, Impax reports on the positive environmental impact of its thematic investments; this positive impact is an outcome of its investment style.

   Mark Campanale is the Founder of the Carbon Tracker Initiative and conceived the 'unburnable carbon' capital markets thesis. He commissioned and was editor of *"Unburnable Carbon – Are the World's Financial Markets Carrying a Carbon Bubble?"* report in November 2011. Mark is responsible for management strategy, board matters and developing Carbon Tracker's capital markets framework analysis. Their goal is to align capital markets with natural ecological limits to growth.

Prior to forming these groups, Mark had twenty-five year's experience in sustainable financial markets working for major institutional asset management companies. Mark is a co-founder of some of the first responsible investment funds, initially at Jupiter Asset Management in 1989 with the Ecology Funds, NPI with Global Care, the AMP Capital Sustainable Future Funds, and Henderson Global Investor's Industries of the Future Funds.

Henrik Jeppesen is the Head of Investor Outreach North America for Carbon Tracker based in New York to develop the organization's capabilities, build awareness and understanding of carbon and stranded asset risk amongst institutional investors and to broaden the distribution and usage of Carbon Tracker's proprietary research.

Prior to Carbon Tracker, Henrik had twenty year's experience in financial markets working for major investment banks and institutional asset management companies focusing on energy investments based in Copenhagen, London and New York. He has an MSc in finance from Copenhagen Business School and holds the CFA, CIPM, CAIA designations as well as SASB's FSA Credential.

Carbon Tracker is an independent financial research organization that carries out in-depth analysis on the impact of the energy transition on capital markets and the potential investment in fossil fuels. Its team of financial market, energy and legal experts apply groundbreaking research using leading industry databases to map both risk and opportunity for investors on the path to a low-carbon future.

Impax and Carbon Tracker's collaboration: In 2015 Impax strategically partnered with Carbon Tracker to develop "SmartCarbon™", a smart beta strategy which asset owners can use to reweight their equity portfolios to reduce the carbon risk associated with policy change and potential government intervention in fossil fuel markets. In 2017 the TCFD recommended measuring climate risk using a scenario approach to carbon pricing, which is a key component of the SmartCarbon™ methodology. Carbon Tracker's research and data are crucial inputs to the SmartCarbon™ methodology which was developed and is maintained by Impax. Details on SmartCarbon™ are provided in Attachment 1 of this RFI.

5. **Please state whether the responder is able to provide the Investment Analysis Services, or a portion of such work, including legal fiduciary analysis services, and is likely to respond to an RFP that includes Investment Analysis Services. If yes, please respond to the questions in Attachment 1.**

   Yes - Impax is able to provide such services. Please see Attachment 1.

B. Information Requested Regarding RFP and Investment Analysis

RFP Structure for Investment Analysis Services

1. **What specific areas, factors, risks and impacts should an RFP consider in order enable selection of a provider or providers that can best conduct comprehensive and in-depth Investment Analysis Services?**

- Provider should have experience managing or advising on institutional pools of capital.
- Provider should have experience with equity, fixed income, and private capital portfolio construction.
- Provider should have solid understanding of the investment risks that are accumulating in the fossil fuel energy sector and dedicated resources to analyze risks as they continue to evolve.
- Provider should have expertise in energy policy across the globe. This includes a sound understanding of potential/anticipated policy changes in key countries and regions, and how these changes may impact various subsectors of the energy markets.
- Provider should be aware of and sensitive to risks that may arise from simply excluding the energy sector it its entirety, as it is a material component of global indices (e.g., increase in volatility and tracking error, potential underperformance).
- Provider should have a sophisticated understanding of other currently available methodologies for estimating and minimizing exposure to carbon risk.
- Provider should have a strong understanding of carbon footprinting analysis, its utility and limitations in helping asset owners understand financial risk.
- Provider should have advice as to how to reinvest divested assets with minimal tracking error to global equities.
- Provider should have the ability to report on results of divested/reinvested portfolio versus original portfolio.
- Provider should have the expertise and ability to continually evaluate risks and opportunities as the transition to a lower carbon economy unfolds.

2. What other important questions should be included in an RFP that includes Investment Analysis Services?
   - Which market sectors should be analyzed as part of the Investment Analysis Services related to divestment?
   - How should carbon risk be assessed?
   - How should a portfolio be modified in light of carbon risk analysis?
   - Do you have a track record related to full or partial divestment of a global equity portfolio?
   - Do you have a specific recommendation for reinvestment of divested assets?
   - What are the potential risks related to divestment from your perspective, and what are potential ways to mitigate these risks?
   - What is your approach to calculating a company's carbon footprint? Where do you source your carbon data? How often is it updated?
   - Do you believe carbon risk extends beyond just the Energy Industry as classified by GICS?
   - What do you consider the most material risks for each GICS subsector of the Energy industry? How do you incorporate these risks into your investment process?
   - Do you consider other ESG risks in your investment process?
   - What tools, research and resources (internal and external) do you use for your analysis?
   - How is your firm preparing clients for the transition to a low carbon economy?

- Are there any potential conflicts of interest regarding your firm's divestment recommendations, such as other business units directly raising money for or investing in fossil fuel companies?
- Provide three relevant client or donor references.

3. **What information and format do you believe would be useful for soliciting and evaluating Investment Analysis Services?**

   It would be useful to provide access to the Systems' most recent quarterly equity, fixed income and private equity holdings report so that providers can analyze the data and submit a formal proposal plan.

   Regarding solicitation, it would be most efficient to select a small pool of qualified candidates to answer the RFP. It is important to provide these candidates with sufficient time (i.e., at least two months) to complete the RFP and develop divestment proposal plans, as it will likely require significant time and resources.

   Divestment over a five-year period will require dynamic portfolio management to keep up with ever-changing market conditions. While mapping out a five-year plan should be a key objective of the RFP, it is important to allow providers the flexibility to adapt their recommendations based on future policy changes and evolving market conditions.

4. **What criteria, experience and qualifications for services providers should be considered for Investment Analysis Services?**
   - Provider should have an established reputation and expertise in developing and advising investment structures for institutional clients related to sustainable investment.
   - Provider's interests should be aligned with the Systems' interests; a significant portion of the provider's business, resources and long-term goals should be focused on the transition to a lower carbon economy.
   - Provider should be a UNPRI signatory and involved in industry initiatives such as the Task Force for Climate Related Financial Disclosure (TCFD), the Investor Network on Climate Risk (INCR), the Institutional Investor Group on Climate Change (IIGCC), the Sustainable Accounting Standards Board (SASB) and/or other related organizations. These initiatives will likely shape future regulation which will directly impact portfolio holdings both within the energy sector and more broadly across equity portfolios.

Approaches to Investment Analysis Services

5. **What do you believe are best approaches to:**
   a. ***Determining the scope of companies, including further defining fossil fuel reserve owners, appropriate for divestment.***
   b. ***Determining the timetable and specific milestones within a five-year period appropriate for divestment.***

      Answer to questions (a) and (b):

Impax's approach is based on four principles chosen to facilitate the development of an actionable plan for the Systems:

- **Simplicity,** focusing on higher order issues. For the reasons outlined in (d) below, we have confined our analysis to those companies engaged in the exploration and/or production ("E&P") of fossil fuels.

- **Direct financial impact.** We have looked at the potential consequences of policies to limit climate change on cash flows rather than using carbon footprinting or carbon emissions as a proxy;

- **Portfolio optimization.** We recommend that capital reduced from the fossil fuel sector be re-invested in the Energy Efficiency sector, which our research suggests would optimally maintain energy price factor exposure while avoiding undesirable carbon risk; and

- **Dynamic management.** As climate change risk and policy responses are likely to evolve considerably over the next five to ten years, we suggest that the Systems plan for periodic adjustments in this assessment and response. We also argue that the Systems should: (a) continue to press E&P companies where they have partially reallocated their holdings for greater disclosure on carbon risk issues; (b) liaise with regulators to put pressure on those companies to disclose additional information that can facilitate the assessment of carbon risk; and, (c) continuously refine and recalibrate their assumptions to incorporate new market, regulatory and scientific information.

These four principles were the basis of a smart beta, scenarios-based strategy which Impax developed in collaboration with Carbon Tracker and has titled "SmartCarbon™".

c. ***Assessing appropriate divestment approaches based on asset classes, strategies and styles.***

The response to this RFI is in regard to the Systems' global equity portfolio only.

d. ***Analyzing the investment risks posed by climate change and fossil fuel reserve owners to the Systems' portfolios (including scenario analysis).***

Government intervention to reduce pollution is typically based on taxation, "cap and trade" schemes or standards; in the context of policy to mitigate climate change, we focus on "Carbon Pricing" as a proxy for these policy instruments.

Focusing on E&P Stocks

For a typical investor, a material exposure to carbon risk arises through ownership of companies engaged in the exploration and production of fossil fuel assets ("E&P Stocks"). As these companies produce commodities that are marketed widely, they typically have weak pricing power i.e. are unlikely to be able to pass on the full effect of Carbon Pricing to their customers or to adjust their revenue or asset base quickly enough to avoid this exposure. In contrast,

many other companies such as regulated utilities, manufacturing businesses and logistics or transportation operators may be significant energy consumers and have a material "carbon footprint", but are likely to mitigate the impact of any increase in their energy costs arising from Carbon Prices, for example by raising their own prices, changing their business models or relocating where Carbon Prices are more favorable. Given the complexity of these effects, we believe that a scenario analysis of E&P Stocks can be used to develop a model for assessing and managing that risk.

To determine the potential impact on E&P Stocks we analyzed detailed, projected production curves of the relevant E&P companies within the MSCI World Index and identified those where we see the highest risk to valuation from Carbon Prices.

Although we do not expect a global Carbon Price to be introduced in the foreseeable future, evidence from China, the European Union, the United States, Canada and other countries indicates that national or regional Carbon Prices are increasingly likely.

To minimize complexity, we have modelled a global Carbon Price, which can be thought of as the weighted average of individual national or regional carbon prices which will actually be implemented, or more broadly as the shadow cost, for the representative investor, of potential regulation aimed at curbing greenhouse gas emissions.

Assessing the impact on cash flow and valuation of E&P Stocks
Our analysis is based on a straightforward discounted cash flow model to formalize our views on carbon risk. We have used scenarios to estimate the potential impact to each company's cash flow from Carbon Prices and determined an expected anomaly in each stock price today.

e. ***Analyzing potential investment impacts on the Systems' portfolios of divesting from the securities of fossil fuel reserve owners, including impacts on return, risk, diversification and cost (including tracking error).***
f. ***Assessing potential alternative investments available to the Systems that have risk and return characteristics equivalent to the securities that may be divested.***

Answer to questions (e) and (f):

Re-investment in Energy Efficiency or Lower Risk E&P Companies (but not Renewable Energy)
We recommend that the Systems should: (a) reduce exposure to E&P Stocks whose assets are likely to be most impacted by Carbon Prices; and (b) in order to maintain their energy factor exposure, redeploy the reduced amounts into stocks whose principal business is in the Energy Efficiency sector ("Energy Efficiency Stocks") – prices of these stocks[1] are typically correlated to retail

[1] In considering this switch, the Systems should also note that the E&P Stocks and Energy Efficiency stocks are exposed to other risks that are not described in this RFI.

energy prices, which, as explained above, are likely to rise when Carbon Prices are imposed. We have also modeled an alternative to reinvesting in energy efficiency which would instead reallocate the funds to lower risk E&P companies.

We have not included companies active in renewable energy markets models for two reasons: (a) their stock prices have a lower historical correlation to both the oil price and the MSCI World Energy Index than do Energy Efficiency Stocks, most likely due to the high exposure of renewable energy markets to changes in government policy[2]; and (b) the universe of renewable E&P Stocks is dominated by a small number of large cap names, and so, in our view, provides an unattractively high level of stock-specific risk.

RESULTS:

Impax established a paper portfolio on 1 September 2015, and have re-run with updated data regularly. The most recent update was in March 2018. Results are listed below.

There are two SmartCarbon™ solutions, which differ only in the way they reinvest the proceeds from divested stocks.

- **SmartCarbon™ A** reallocates proceeds from divested E&P companies to lower risk E&P companies.
- **SmartCarbon™ B** reallocates proceeds from E&P companies to Energy Efficiency companies who are expected to benefit from higher carbon prices.

Performance[3]

Both SmartCarbon™ solutions have outperformed the unadjusted portfolio since inception by 40 and 60 basis points respectively and an excess return of 8 and 9 bp since the last rebalance in September 2017. While SmartCarbon™ B has been designed to exploit the reinvestment opportunities, both strategies have a primary objective to address climate change risk.

Tracking Error vs MSCI World (MXWO)

The tracking error of both SmartCarbon™ solutions has been low over time (Table 1). The strategy has been designed without a constraint on tracking error to enable SmartCarbon™ portfolios to be able to fully respond as carbon price scenarios evolve. However, the SmartCarbon™ reinvestment approaches are fundamentally expected to keep the tracking error low and relatively stable.

- **SmartCarbon™ A** maintains the overall exposure to the E&P sub-sector through reallocation to lower risk E&P stocks.
- **SmartCarbon™ B** minimizes tracking error by increasing investments in Energy Efficiency companies who are expected to benefit from higher retail energy prices.

[2] e.g., "US solar shares rise on hopes for tax credit extension" - http://www.reuters.com/article/us-usa-stocks-solar-idUSKBN0TY2KF20151215.
[3] Return numbers are quoted on a gross basis.

Table 1: SmartCarbon historical tracking error data as of March 2018

	March 2018	Highest since launch	Lowest since launch
SmartCarbon™ A	13 bp	17bp	6 bp
SmartCarbon™ B	29 bp	37 bp	21 bp

Source: Bloomberg. Data as at 31 March 2018.

Dividend Yield

The energy sector can be an important source of dividend yield to a portfolio as well as the source of material climate change risk. Both SmartCarbon™ solutions have minimal impact on the aggregate dividend yield.

- For the **SmartCarbon™ A** portfolio, the rotation to lower risk E&P companies provides a higher historical dividend yield of 2 to 3 basis points. This is due to the increased weighting in some of the larger E&P companies whose diversified reserves are less exposed to becoming stranded in the future.
- For **SmartCarbon™ B** portfolio, Energy Efficiency companies tend to have a marginally lower dividend, but offer higher potential return growth.

Note: These results are based on model performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under-or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown.

6. Are there any precedents that can help guide the approach to analyzing the impacts of and determining a prudent strategy for divesting from fossil fuel reserve owners?

There has been a strong focus on "carbon footprinting" as a mechanism for assessing risk, whereby the (direct and possibly indirect) CO_2 emissions of a company are used as a proxy for its financial exposure to climate change policy[4]. This approach has already been questioned on the grounds that there is no consensus on the methodology[5]. However, we are also concerned that a "footprinting" approach typically takes no account of the pricing power of the underlying company, i.e. its ability to pass on cost increases (for example those linked to future Carbon Prices) to its customers, for example those arising from taxation of fossil fuel supply; by mispricing carbon risk, footprinting may actually increase risk. Our analysis focuses instead on estimating the direct financial impact on individual companies of likely changes to government policies.

A further aspect of risk assessment methodology is the depth of analysis. Carbon Tracker developed the original "unburnable carbon" concept, and is widely regarded as the international leader in this class of analysis. It has produced corporate-level supply cost curves for each of the fossil fuels – coal, oil and gas,

[4] e.g. http://www.theactuary.com/features/2015/06/carbon-risk-how-do-we-measure-and-manage-it
[5] e.g. http://www.iigcc.org/files/publication-files/Carbon_Compass_final.pdf (pp17-46)

utilizing asset-level cost data[6] with the oil & gas analytics powered by Rystad Energy Group's UCube database. A recent paper by the Smith School of Enterprise and the Environment argues that analysis of carbon risk should be done at the level of the individual asset in relation to the power sector[7].

Regarding how a portfolio should be modified, many analysts recommend that investors tilt their portfolios away from holdings that are deemed "risky" from a climate and carbon risk perspective, typically with rebalancing to reduce tracking error versus a benchmark[8]. We are concerned that this methodology places too much reliance on historical risk profiles and is therefore inconsistent with an overall thesis that the investment risk landscape for climate change has changed significantly in the last two to three years. Equally, as set out above, we believe that an explicit allocation of exposure from "fossil fuel energy" to "energy efficiency" gives the best expected risk-return profile.

7. **What are ways to address the costs of externalities in investment portfolios that can help mitigate risk?**
8. **How do you view the extent to which the market currently prices in climate change risk and, specifically, the economic and investment risks related to the carbon intensive businesses such as fossil fuel reserve owners?**

Answer to questions (7) and (8)

Government intervention to reduce pollution is typically based on taxation, "cap and trade" schemes or standards; in the context of policy to mitigate climate change, we focus on "Carbon Pricing" as a proxy for these policy instruments.

As previously mentioned, there are strong indications that today's prices of energy stocks do not account for the full risk of such government intervention. The recent rapid, catastrophic demise of coal stocks suggests an important precedent regarding market mis-pricing.

Given the complexity of the issue, investors seeking a comprehensive analysis may struggle to implement their ideas. We recommend an approach that focuses on "first order" issues.

The most popular methodologies to date rely on "carbon footprinting"; however, as described in question (6) above this typically fails to take account of a company's pricing power, and investors who use it to guide portfolio changes may actually be increasing risk.

Impax has concentrated on listed companies engaged in the exploration and production of fossil fuel assets ("E&P Stocks"). As principal producers of fossil fuels globally, their operations are obviously intrinsically linked to carbon risk. And as suppliers of globally traded commodities, these companies are unlikely to be able to pass on the full effect of Carbon Pricing to their customers or to quickly adjust their revenue or asset base to avoid this exposure.

[6] Carbon supply cost curves series, available at http://www.carbontracker.org/library/#capex-analysis
[7] See http://www.smithschool.ox.ac.uk/research-programmes/stranded-assets/satc.pdf
[8] e.g http://www.top1000funds.com/profile/2014/09/19/the-challenges-of-a-low-carbon-mandate/

Using a scenario approach to Carbon Pricing, Impax has analyzed the economic risk of major stocks in the MSCI World Energy Index, computing an expected valuation anomaly in those potentially affected. The expected valuation anomalies have informed the appropriate level of re-allocation of each stock.

We recommend that re-allocated amounts are reinvested in a basket of stocks of companies providing goods/services that enhance energy efficiency. These stock prices are typically correlated more closely with the retail price of energy (which is expected to rise with Carbon Prices) than with the wholesale price of energy (which is expected to fall), and reinvestment in energy efficiency maintains important sector risk exposure for the Systems.

9. **How could divestment be effective in influencing fossil fuel reserve owners to take steps toward addressing carbon risk?**

Impax believes that our targeted approach provides the Systems with a straightforward, actionable roadmap for assessing climate change risk and implementing appropriate responses at a portfolio level. In addition, the divestment from the highest carbon risk holdings sends a clear signal to the fossil fuel market of the Systems' unwillingness to accept unlimited carbon risk liability through its stock holdings. That signal is reinforced by the Systems' decision to maintain exposure to lower carbon risk holdings in the sector. The Systems would be clearly signaling their willingness to continue to support companies that were operating in a more responsible manner with regards to their inherent carbon risk.

Given both the complexity of this issue and the changing market/policy dynamics, we strongly recommend that the Systems also integrate three further steps into their approach:

- Seek additional information from fossil fuel asset owners (disclosure of information around the impact of Carbon Prices on future production can significantly improve the risk analysis);
- Engage with market regulators to mandate further disclosure of information around climate change risk; and
- Continuously refine their assumptions and modelling of this issue in order to adjust their positioning as the quantum, timing and likelihood of Carbon Pricing evolves. We recommend that the model is updated at least every six months.

Should the Systems wish to engage with management teams of E&P Stocks, they can still do so if they opt for partial reallocation. Selling a portion or even the preponderance of a stock that is deemed "risky" and engaging with management to discuss a change of strategy that could mitigate the perceived risk is, in our view, entirely appropriate.

Attachment 1

a. **What services can you provide that could satisfy the Investment Analysis Services sought in the above-referenced RFP? Describe briefly what other services relating to mitigating climate change or carbon risk you can you provide.**

Impax seeks to help the Systems manage climate change risk in equity portfolios using a "smart beta", scenarios-based approach known as SmartCarbon™ and described in the questions above. We model the impact on company cash flows of potential future government intervention to reduce greenhouse gas emissions and replace a market-weighted basket of exposed stocks with a new, optimized basket. We also recommend that portfolios are updated twice a year to reflect new risk information.

Impax collaborated with Carbon Tracker, a leading independent financial think tank focused on the energy sector to develop the SmartCarbon™ methodology, and relies on Carbon Tracker's continued research to generate and maintain updates to the portfolio based on evolving policy frameworks and market conditions.

Impax's proposal is to supply the Systems with the Impax SmartCarbon™ portfolio, which includes the following services:

1. Assessment of climate change transition/policy risk on listed companies worldwide;
2. Scenario analysis of the impact of government intervention on the most vulnerable companies;
3. Portfolio optimization recommendations;
4. Dynamic adjustment to reflect changing risk factors; and
5. Advice with respect to sector allocations and stock selection.

The SmartCarbon™ portfolio currently reflects risk analysis and management in the Energy sector, which Impax believes to be the most exposed to transition/policy risk.

Portfolio rebalancing

Impax will provide a model portfolio four times a year to account for the two semi-annual SmartCarbon™ rebalances and four quarterly index and sector rebalances. The model portfolio will include sector and stock selection advice through the SmartCarbon™ optimization.

Client service and reporting

On a quarterly basis, Impax will formally report on changes in climate and energy policy and on the developments in the SmartCarbon™ portfolio. The report will include:

- Summary of investment recommendations;
- Summary of performance and risk attribution analyses;
- Identification of developing investment themes, policy approaches and carbon pricing scenarios within SmartCarbon™;
- Specific action oriented advice on individual stocks;
- Discussion of investments in the equities related to SmartCarbon™ approach.

The reporting will form the basis for quarterly conference calls or meetings to discuss the topics in more detail and the evolution of the SmartCarbon™. Finally, we will also make the SmartCarbon™ team available for *ad hoc* calls in case

urgent topics need to be discussed in the interim. Generally, we hope to serve as an additional resource for the investment team at the Systems.

Further research developments

Impax will report to the Systems any developments of the SmartCarbon™ model, for example shifts in the risk assessment of additional economic sectors. Impax is currently analyzing the Basic Materials sector and will report the results in H2 2018. We would expect to be in regular contact with the Systems to discuss investment ideas, the timing of any proposal action as well as developments in the SmartCarbon™ portfolio.

b. **Describe your business including your primary business activity and all the professional services that you or your company or organization provide.**

Impax Asset Management

Impax believes that demographic change, resource scarcity, inadequate infrastructure and environmental constraints will shape private sector markets profoundly. These trends, which will progressively drive the transition towards a more sustainable global economy, will lead to out-performance for well-positioned companies. Portfolios that account for the risk of both sudden shocks and long-term value erosion can out-perform. Impax invests in companies with sustainable competitive advantages, track records of consistent returns on investment, and where it believes a company's attractive, bottom-up, financial characteristics and long-term opportunities are not reflected in its share price.

Impax aims to build shareholder value by delivering strong investment results to clients. Impax believes that environmental markets will continue to grow rapidly and offer clients compelling investment opportunities for many years to come. Impax believes that its ownership structure, which has been stable for over a decade, is well suited to pursuing and realizing this objective. Impax's business strategy is focused on delivering value for current clients through existing investment strategies, and attracting new clients to those strategies subject to capacity constraints. Impax also selectively add complementary investment strategies when appropriate to the business and in line with client demand.

c. **What skills, experience, expertise or tools do you have that enable you to provide Investment Analysis Services? Please include a list of similar prior projects and/or services; a description of experience with providing similar services to public pension funds or other institutional investors; and the length of time that you and your company or organization have provided such services.**

Impax Asset Management:

Impax is one of the longest established environmental investment managers in the world. Impax has been an active manager of global equities since 1999, when it launched its first listed equity strategy for an advisory contract with Alm. Brand Invest in Denmark. Since then Impax has launched a further four active global equity strategies (and one Asia-Pacific equity strategy), which have today surpassed US$11.3bn in AuM (data as at March 2018). Impax manages active global equity funds and segregated accounts for institutional investors and distributors in Europe, the United States, and Australia.

Impax has a large, multi-disciplinary investment team, comprising individuals with diverse backgrounds. This allows a balanced dialogue due to the complementary skills and substantial industry knowledge which adds depth to Impax's investment process. The different skill sets include: highly experienced portfolio managers, scientists, former business analysts, bankers, venture capitalists, and regional and legislation specialists. The team uses this knowledge base to bring sector, financial and region-specific understanding to stock selection and portfolio construction.

The firm's ESG research is fully integrated within the investment process. A stock's ESG rating (generated internally) has a direct effect on the approval and the permitted exposure for inclusion within client portfolios. Impax London employs dedicated policy research to understand policy and legislative drivers for every sector.

d. Would you be willing to serve as a fiduciary to the Systems if you performed the Investment Analysis Services?

Yes, Impax would. Carbon Tracker provides data and analysis to Impax and would not act as a fiduciary.

e. What are your sources of income other than from clients? If you are a not-for-profit organization, please identify your donors.

Impax's income is solely derived from clients.

Carbon Tracker is a non-profit organization whose primary source of income is donors. Below are some of the organizations that have provided funding to Carbon Tracker:

- Bloomberg Philanthropies
- ClimateWorks Foundation
- Energy Foundation
- European Climate Foundation
- Flora Family Foundation
- Frederick Mulder Foundation
- Generation Foundation
- Grantham Foundation
- Growald Family Fund
- Horizon 2020 of the European Union
- Kenneth Miller Trust
- KR Foundation
- MAVA Foundation
- NextGen Climate Action
- Oak Foundation
- Rockefeller Brothers Fund
- RS Foundation
- SEM Charitable Trust

- Tellus Mater
- The Ashden Trust
- The Climate Change Collaboration
- The Joseph Rowntree Charitable Trust
- The Kestrelman Trust
- The Polden Puckham Charitable Foundation
- The Rockefeller Foundation
- The Velux Foundation
- The William and Flora Hewlett Foundation
- V. Kann Rasmussen Foundation
- Wallace Global Fund
- Zennstrom Philanthropies
- Finance Dialogue

f. What is the estimated pricing structure and cost for provision of Investment Analysis Services?

Pricing structure and cost for provision of the Investment Analysis Services is negotiable and will depend on the size, scope and timeline of the project.

III. Additional Resources

- Impax - SmartCarbon White Paper
- Impax - SmartCarbon Update March 2018
- Carbon Tracker – Unburnable Carbon: Are the World's Financial Markets Carrying a Carbon Bubble?
- Carbon Tracker – Mind the Gap