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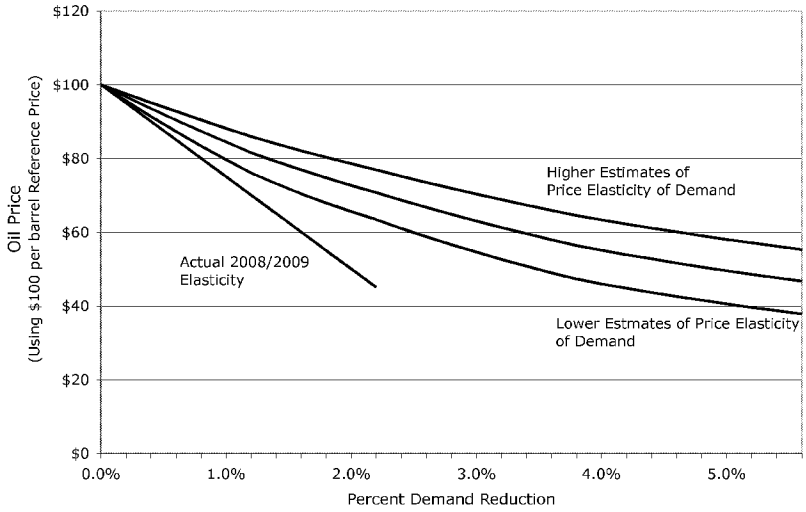
(54) Title: METHODS TO PROVIDE SUBSTITUTE PRODUCTS FOR INELASTIC MARKETS

FIG. 4 Crude Oil: Price Elasticity to Reduced Demand



(57) Abstract: A method for reducing prices in a market exhibiting a price inelasticity of demand for a product, wherein the product price before using the current methods significantly exceeds the cost of production. The method involves using a program of private sector incentives supplied by a private sector entity to deploy a first portfolio of substitute products that compete with the inelastic market product; or use private sector incentives to deploy new substitute systems or services that utilize a second portfolio of substitute products that together substitute for the inelastic market product. In some embodiments the government entity implements a tax or fee on the inelastic market product, thus capturing a portion of the customer cost savings due to the price declines, and uses the tax or fee proceeds to compensate the private sector entity.

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METHODS TO PROVIDE SUBSTITUTE PRODUCTS FOR INELASTIC MARKETS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit under 35 U.S.C. § 119(e) to U.S. Provisional Application Serial No.: 61/699,074, filed September 10, 2012, the content of which is incorporated by reference in its entirety into the present disclosure.

BACKGROUND

[0002] The present disclosure relates generally to methods of reducing energy costs and consumption.

[0003] In the U.S. and many other countries, there exist an abundance of government incentives and directives to reduce energy cost by promoting reduction of energy use and development and use of alternative energy, among others. Prompted by such incentives and directives, new equipments that use less energy and new energy sources have been developed. One such example is green vehicles.

[0004] There is a major problem with these incentives and directives, however. For instance, as green vehicles significantly penetrate into the vehicle fleet, the majority of energy cost savings actually accrues to customers that use crude oil, rather than the green vehicle purchasers. This is because reduced petroleum demand due to rapid green vehicle deployment and increased biofuel supply lowers crude oil prices. It is estimated that, if global oil demand falls by only 3% in an accelerated timeframe of five years, crude oil prices would fall 50%, as evidenced by the market price drop in late 2008.

[0005] Therefore, much of the benefit from the existing incentives and directives actually goes to crude oil users, leading in inefficient promotion of energy conservation and alternative energy development.

[0006] Furthermore, it is also recognized that a challenge for providing efficient government incentives and directives arises from that each energy market is different. Three largest energy markets include vehicle fuels, electricity, and natural gas. Each energy market needs customized/optimized energy policies. Reaching an optimal solution set, therefore, requires a knowledgeable "pick and choose" process. In this context, a different set of optimal solutions work best for each energy market, and different solutions have substantially different capital cost/ operating cost structures, with debt financing often the key to providing best value to stakeholders.

[0007] The current energy policies rely on the value judgment "free market is best". Unfortunately, free energy markets have not functioned properly. The major energy markets currently exhibit dysfunctional outcomes inconsistent with perfect free market theories. Using the "free market is best" value judgment to guide energy policies has increased customer and supplier costs substantially. Additionally, the energy markets do not have level playing fields. Privately owned projects receive subsidies larger than publicly owned projects.

[0008] The present disclosure provides methods and systems to address these problems and challenges.

SUMMARY

[0009] One embodiment of the present disclosure provides a method for forecasting a price for a traded fixed price commodity for a forecast period, comprising:

(A) obtaining retrospective data regarding the past cost of the commodity for a predetermined time period and determining average price trend for the commodity in terms of annual percentage increase; or alternatively, fitting the cost data with a trend line using predetermined fitting methods, and calculating the average price trend in terms of annual percentage increase;

(B) determining the average price for the commodity over a recent shorter time period to obtain a base price for the forecast period; or alternatively, using the

trend line reading at the beginning of the forecast period to set the base price;

(C) multiplying the base price from step (B) by the annual percentage increase calculated in step (A) and adjusted to represent the length of the next time period, to set the reference price for the next time period; then escalating reference prices for successive time periods by applying the annual percentage increase from step (A) adjusted for time period length, for each predetermined future time period to set the reference price forecast; and

(D) optionally adjusting the reference price forecast lower to reflect a maximum price annual percentage increase lower than the price trend average annual percentage increase calculated in step (A).

[0010] In some embodiments, at least one step of (A)-(D) is performed by a computer.

[0011] In one aspect, the method further comprises periodically collecting the trade price data to calculate the average price during the most recent price period; then subtracting this trade average price from the forecast reference price to calculate the price reduction; then multiplying this price reduction by the total amount of commodity consumed over the time period, to calculate the estimated annual cost savings to customers due to the improved commodity price.

[0012] In one aspect, the method further comprises setting compensation for an intervener in the commodity market, whose activities, investments, and expenditures provided and promoted substitute materials, systems, and practices, to reduce commodity demand; and wherein said compensation is set proportional to the amount of estimated annual cost savings to the fixed price commodity customers, using a predetermined formula to calculate the compensation using the annual cost savings as input to the formula.

[0013] In one aspect, the method further comprises using an organization to provide regulatory oversight of the compensation determination, said organization with the ability to modify the calculations and input to the calculations, used in the methods of

claim 3; wherein the regulatory oversight optionally may be able to evaluate measures of profitability, levels of investment, and timing of investments and expenditures and compensation payments, in order to adjust compensation to the intervener.

[0014] In one aspect, the method further comprises using the organization conducting regulatory oversight of compensation, to also conduct regulatory oversight to assess and determine how each of the intervener's actions has affected externalities, including environmental impact, economic benefits, and national and global security issues.

[0015] Systems and storage media are also provided for implementation of the present methods. One embodiment provides a system, comprising a processor, memory and program code which, when executed by the processor, configures the system to forecast a price for a traded fixed price commodity for a forecast period by:

(A) obtaining retrospective data regarding the past cost of the commodity for a predetermined time period and determining average price trend for the commodity in terms of annual percentage increase; or alternatively, fitting the cost data with a trend line using predetermined fitting methods, and calculating the average price trend in terms of annual percentage increase;

(B) determining the average price for the commodity over a recent shorter time period to obtain a base price for the forecast period; or alternatively, using the trend line reading at the beginning of the forecast period to set the base price;

(C) multiplying the base price from step (B) by the annual percentage increase calculated in step (A) and adjusted to represent the length of the next time period, to set the reference price for the next time period; then escalating reference prices for successive time periods by applying the annual percentage increase from step (A) adjusted for time period length, for each predetermined future time period to set the reference price forecast; and

(D) optionally adjusting the reference price forecast lower to reflect a maximum price annual percentage increase lower than the price trend average annual percentage increase calculated in step (A).

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Provided embodiments are illustrated by way of example, and not limitation, in the figures of the accompanying drawings in which:

[0017] **FIG. 1** is a schematic illustrative diagram depicting a generalized embodiment of the current disclosure, wherein a private sector entity provides incentive payments to producers or customers of substitute products, or to suppliers or customers of new substitute systems utilizing substitute products; and wherein the private sector entity receives compensation in the form of a share of customer cost savings passed through a government entity, which collects the compensation by placing a new tax or fee on the dominant product to capture a portion of customer cost savings;

[0018] **FIG. 2** is a schematic illustrative diagram depicting prior methods for introducing substitute products using government entity subsidies given to substitute producers or substitute systems suppliers, or their customers;

[0019] **FIG. 3** is a schematic illustrative diagram depicting an embodiment of the disclosure used to increase biofuel and ethanol use in the transportation fuels market; and increases the population of vehicles that utilize biofuels, or increases population of electric vehicles, in the transportation fleet;

[0020] **FIG. 4** is a graph illustrating the estimated price elasticity of demand for the crude oil market based on recent oil price changes due to changes in global crude oil demand; and

[0021] **FIG. 5** is a flow chart illustrating exemplary steps for calculating compensations using customer cost savings, based on retrospective cost and price data.

[0022] It will be recognized that some or all of the figures are schematic representations for purposes of illustration and do not necessarily depict the actual relative sizes or locations of the elements shown. The figures are provided for the

purpose of illustrating one or more embodiments with the explicit understanding that they will not be used to limit the scope or the meaning of the claims.

DETAILED DESCRIPTION

[0023] The current disclosure provides methods for reducing costs and prices in a market exhibiting a price inelasticity of demand for a dominant product or service, such as energy, where the product price to the consumer significantly exceeded the production cost. The methods comprise a program of incentives that in one aspect are from the private sector and supplied by the private sector entity in combination with a government entity to levy a tax or fee that will recover a portion of the customer's cost savings, and uses at least a portion of the proceeds to compensate the private sector entity, thus facilitating investment recovery and providing a return on the private sector entity risk investments. The terms of the agreement between the private entity and the government entity would reward bigger price reductions.

[0024] As an example of the method, is a means to reduce crude oil demand. The oil market exhibits very inelastic behavior, with large oil price drops exceeding 50% with demand declines of less than five percent. Consider a reference oil price forecast based on current vehicle fleet composition and fleet fuel use: If substitute non-oil products like ethanol and biodiesel captured an additional 2 to 5 percent of the global market, coupled with green vehicles such as plug-in hybrids comprising over 10% of the global vehicle fleet within ten years, then the price of oil would fall substantially below an accurate reference price forecast based on much lower vehicle fleet substitution. The price of crude oil would likely fall over 50% from the current level of $96 per barrel. Clearly investing to ramp green vehicle production and sales, increased use of non-petroleum based vehicle fuels, and other means of reducing crude oil demand should result in large cost savings for petroleum based product customers due to the resulting drop in crude oil prices.

[0025] If a private sector entity makes the investment providing incentives that drive the ramp in green vehicle production and sales, or additional investments providing the incentives to ramp substitute fuel production and sales, the entity needs some means of generating cash flow to pay back the investment and earn a return. However, the methods require some means of sharing customer cost savings due to lower oil prices with the private sector entity making the incentive investments. Otherwise the private sector entity can't recover the investment, let alone receive a commensurate rate of return, even while providing the customer with large cost savings. So even with high economic benefits from making investments to rapidly ramp green vehicle use and increase biofuel and alcohol fuel share of the vehicle energy market, private sector entities are unable to capture a significant portion of the cost savings to customers, as well as ancillary benefits such as lowered environmental impacts, decreased national security risks, and positive economic impacts.

[0026] The disclosure addresses this problem by using methods that ask government entities to capture a portion of the cost savings received by crude oil and oil products customers. A portion or share of customer cost savings is recovered through a fee or tax on crude oil or oil products. Then the government entities pay compensation to the private sector entity using at least a portion of the proceeds raised by the tax or fee. Other means wherein the government raises funds, and compensates the private sector entity for their investments that resulted in declining oil product prices are also practical, and these optional methods are included in the current disclosure.

[0027] The key improvement facilitated by the current methods of this disclosure, sets up a private sector entity, most likely an independent company owned by a variety of different investors, that invests money to introduce green vehicles or other vehicles that don't utilize oil products. The private sector entity could invest money to reduce global crude oil demand by other means as well, by introducing more energy efficient methods and systems. The private sector entity would raise funds in the capital markets. In particular they would seek to have vehicle manufacturers, electric power industry

participants, major financial or major insurance companies, or even major oil companies invest in the new private sector entity, since these companies have vested interests making investments that help their existing business units.

[0028] Essentially by using the current methods, the private sector entity would have a strong profit incentive to drive the change in the crude oil market. In particular, auto and truck manufacturers would be able to capture some of the cost savings that accrue to oil products customers, when other customers use substitute fuels or green vehicles and reduce the price competition for oil products. This encourages these manufacturers to increase the number of green vehicles in the vehicle fleet. The resulting change would improve the functioning of the crude oil market, the vehicle fuels market, vehicle manufacturing markets, and even the electricity and natural gas markets. Currently and over the prior several decades, these markets have been dysfunctional served customers sub-optimally, with prices greatly in excess of costs.

[0029] In some embodiments, the present disclosure relate to a set of "customers first" energy policies. It is contemplated that such customers first energy policies meet important customer needs better than existing policies and program.

[0030] First, these customer first policies address each of all four overall important needs, cost, environmental risks, economic impact, and national security, better than existing policies. Further, the customer first policies use a pragmatic blend of private/public sector actions and regulations to improve customer satisfaction.

[0031] Therefore, it is contemplated that the customers' first policies of the present disclosure would result in more rapid deployment of improved energy systems. As rapid deployment reduces risks, these policies would put America into a globally competitive position.

[0032] Furthermore, the customers first policies set the template for global policy makers. Major economies in Europe and Asia will likely implement similar energy

policies. Eventually climate impacts and customer complaints would force implementation of the same end-solutions as customers first policies. However, such "forced" implementation would come with higher costs and environmental damages that would have already occurred.

[0033] More details of certain embodiments of the present technology are illustrated in the attached figures, **FIG. 1-5**.

[0034] It will be appreciated by the knowledgeable reader that systems and methods of the present disclosure can be implemented a computer or computer network. In some aspect, information exchange over the computer network is carried out through secure data communication. Methods and devices for providing secure data communication are well known in the art.

[0035] Embodiments can include program products comprising non-transitory machine-readable storage media for carrying or having machine-executable instructions or data structures stored thereon. Such machine-readable media may be any available media that may be accessed by a general purpose or special purpose computer or other machine with a processor. By way of example, such machine-readable storage media may comprise RAM, ROM, EPROM, EEPROM, CD-ROM or other optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which may be used to store desired program code in the form of machine-executable instructions or data structures and which may be accessed by a general purpose or special purpose computer or other machine with a processor. Combinations of the above are also included within the scope of machine-readable media. Machine-executable instructions comprise, for example, instructions and data which cause a general purpose computer, special purpose computer, or special purpose processing machines to perform a certain function or group of functions.

[0036] Embodiments of the present invention have been described in the general context of method steps which may be implemented in one embodiment by a program

product including machine-executable instructions, such as program code, for example in the form of program modules executed by machines in networked environments. Generally, program modules include routines, programs, logics, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Machine-executable instructions, associated data structures, and program modules represent examples of program code for executing steps of the methods disclosed herein. The particular sequence of such executable instructions or associated data structures represent examples of corresponding acts for implementing the functions described in such steps.

[0037] As previously indicated, embodiments of the present invention may be practiced in a networked environment using logical connections to one or more remote computers having processors. Those skilled in the art will appreciate that such network computing environments may encompass many types of computers, including personal computers, hand-held devices, multi-processor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers, and so on. Embodiments of the invention may also be practiced in distributed and cloud computing environments where tasks are performed by local and remote processing devices that are linked (either by hardwired links, wireless links, or by a combination of hardwired or wireless links) through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

EXAMPLES

Example 1

[0038] The United States consumes almost 19 million barrels per day of crude oil. About 14 million barrels per day is used to produce gasoline and diesel vehicle fuels. If green vehicles compose about 18% of the American vehicle fleet, then crude oil

demand would fall almost 2.5 million barrels per day, about 2.5% of current worldwide demand of 90 million barrels daily. Overall, the United States would save the cost of buying this crude oil, and at $100 per barrel, this reduces crude oil purchases by $90 billion annually.

[0039] But the drop in demand would also cause a drop in crude oil prices. A drop in worldwide demand over the years 2008 and 2009 of only 2.7% caused a crude oil price drop of over $50 per barrel. This market behavior indicates a strongly inelastic market. The crude oil market inelasticity, particularly over short time frames of less than a decade, causes the large swings in oil price due to small changes of several percent in either demand, or in the event of a supply disruption from one of the major producing countries.

[0040] Customers and purchasers of crude oil or oil products would clearly benefit if substitute energy products and or substitute systems that use alternative energy sources had a significant market share and provided alternatives to oil products. If substitutes held a significant market share, at least over 10% and preferably over 20% of the current American market for oil products used for transportation vehicle fuels, then this market penetration by substitutes should result in significantly lower oil prices and reduced oil price volatility.

[0041] Providing additional extra incentives to the United States maximum tax credit of approximately $7500 for plug-in hybrid electric vehicles, would increase sales of these vehicles. For example, the Chevrolet plug-in hybrid Volt has a price of approximately $42000, and the existing tax credit lowers the effective price for customers to $34500. An extra incentive payment to the manufacturer/dealer of $12500 would reduce the effective price to $22,000 very comparable to gasoline powered vehicle prices, and would rapidly increase the sales of these green vehicles. The additional incentives could begin with a high additional incentive of $12,500, then decline over time. As the cost of building manufacturing capacity and design costs of

these vehicles are recovered and spread out over a larger volume of vehicles sold, the cost of building these vehicles should decline, and a lower incentive should be sufficient to continue increasing sales of green vehicles. An average incentive of $9000 per vehicle in addition to the existing tax credit, should be sufficient to drive replacement of 18% of the American fleet of 230 million vehicles within eight to ten years. Providing this level of incentive for the 41 million vehicles that must be added to the fleet would cost $374 billion. Although this investment in sales incentives appears costly, the resulting savings to customers exceeds this cost.

[0042] The shift in the source of the energy used in the transportation vehicle market saves customers money in two ways. Obviously, customers who own various types of electric vehicles or electric hybrid vehicles save money due to the reduction in fuel costs; since electricity costs less, and electric vehicles have higher efficiencies, the owner's cost of buying energy to run the vehicle declines substantially. The cost savings just from this first impact should total over $90 billion annually, for the 18% substitution case examined in this example. By comparison, the total cost of tax credit incentives ($7500 per vehicle purchased) needed to reach 18% of the fleet totals about $310 billion. If the substitution takes eight years to accomplish, then these tax credits cost the United States government about $40 billion annually. So clearly the existing tax credit incentives pay off, since savings of $90 billion annually exceeds the annual tax credit costs of $40 billion. Furthermore the savings would continue for an extended period of years even if the tax credits end.

[0043] The second way that customer costs decline, results from the impact on oil pricing caused by the substitution. Even with a demand reduction of 2.5 million barrels daily, the United States would still consume 16.5 million barrels of crude oil daily. The demand reduction should drop oil prices about $50 per barrel from a reference forecasted price (where there isn't significant substitution in the vehicle fleet). The crude oil price drop would save American customers about $300 billion annually. This

enormous cost savings dwarfs the cost of additional incentives needed to drive vehicle substitution.

[0044] If substitution penetration to 18% of the fleet takes eight years, the cost of the extra incentives ($9000 per vehicle) totals $374 billion over the eight years, with an average annual cost of $47 billion. The annual cost savings eventually should reach $300B, which substantially exceeds the annual $47 billion cost of incentives. Clearly this effort has a very attractive economic impact, even without considering other economic benefits from robust automotive sector growth, national security concerns with imported crude oil supply disruptions, or environmental benefits from reduced fossil fuel use. Capturing fifty percent of the expected cost savings at $150 billion annually should be sufficient to fund the extra incentives provided by the private sector entity.

[0045] If a private sector entity used private capital to pay for the extra incentive payments, and a crude oil tax is set up to recover half of the crude price drop from a reference price forecast, the private sector entity should get attractive returns on its incentives investments. A crude oil pass-through tax set at fifty percent share of crude oil price drop savings would start low. But well within an eight-year period, the cumulative proceeds from the pass-through share of cost savings should exceed the cumulative cost of the incentives. This breakeven point could happen sooner if other governments around the world use comparable vehicle substitution programs, driving world demand down faster, thus resulting in a faster decline in world oil prices.

[0046] The private entity program provided to the government entities, should have a reasonable and useful lifespan of 15-20 years to improve the effectiveness of the incentives and drive the penetration of green vehicles into the fleet over fifty percent. A program lifespan of shorter periods, would use fifty percent sharing of cost savings, whereas periods exceeding 15 years could be profitable with as little as thirty percent of customer cost savings.

[0047] The cumulative net cost of providing the extra incentives could exceed $150 billion before cash flow turns positive; if the pass-through shared cost saving compensation is set too low. But a fast ramp of substitution coupled with fifteen year term cost sharing, could reduce the private sector entity net cost of the extra incentives to less than $80 billion before cash flow turns positive. The terms of the savings share compensation agreement with the government entity are important for the success of a private sector approach.

[0048] One obvious alternative to the method in the current disclosure, involves using government entities to devise and direct the incentives program, monitor progress, and change the incentives program as needed. Although the economic benefits are sufficient that a government directed incentives program should be successful, a private sector entity directed program should be more successful. The private sector entity can initiate investments and expenditures on a wide variety of solutions and improvements, and work closely with private sector companies, or even invest in companies operating in the transportation sector. The private sector entity would have also have strong motivations to coordinate and work closely with government agencies. The large amount of work and coordination needed to improve the effectiveness of the incentives program can be handled more capably by a private sector entity.

Example 2

[0049] One problem with strategizing energy use is the each energy market is different, with different customer and stakeholder needs. The three largest energy markets are vehicle fuels, electricity, and natural gas. Each energy market needs customized/optimized energy policies to reach an optimal solution set requires a knowledgeable “pick and choose” process. A different set of optimal solutions work best for each energy market. Different solutions have substantially different capital cost/ operating cost structures, with debt financing often the key to providing best value to stakeholders.

[0050] Current energy policies rely on the value judgment “free market is best”. Free energy markets have never functioned properly. All the major energy markets currently exhibit dysfunctional outcomes inconsistent with perfect free market theories. Using the “free market is best” value judgment to guide energy policies has increased customer and supplier costs substantially. Yet another problem is that the energy markets do not have level playing fields; privately owned projects receive subsidies larger than publicly owned projects.

[0051] Household Total Expenses approximately $50,000 annually include, housing energy expenses ($2000 annually, 4.0%), which includes household electricity cost ($1300 annually, 2.6%) and household natural gas or heating oil ($700 annually, 1.4%), and transportation fuel costs, which includes gasoline and diesel expenses ($2300 annually, 4.6%). There are large variations with oil prices. Household energy expenses are 8.6% of total expenses

[0052] Historical data show that in 1980, expenses were approximately 12%. In 2000, xpenses were approximately 7%. Over 90% of expenses are spent on fossil fuel based energy.

[0053] A reasonable target is that in 2040, energy should comprise only 4% (four points) of total expenses. Fossil fuel based energy should comprise less than 1 point of this target. Green energy sources should comprise 3 points of this target. Vehicle fuels/energy should add 1 point to this target, comprising only 25% of household expenses versus 55% today.

Current Energy Policies (“Suppliers First”)	**Price GHG Emissions + Green Energy Standards**	**“Customers First” Energy Policies**
Use wars to secure energy supplies.	Raises energy prices; but energy costs level due to improved efficiency.	Lowers energy costs.
Provides safe reliable market	Relies on “free market”	Relies on expert decision

for high cost crude oil.	participants for intelligent decisions.	makers for important energy decisions
Makes the World safe for …. well, not for humans!	Helps make the world safe for people!	Saves our home planet!
Depletes America's natural gas at low prices.	Reduces natural gas reserves quickly.	Conserves natural gas reserves for use over the long haul.
Damages or destroys America's farms, ranches, forests, fisheries, coasts, etc.	Slow to mitigate substantial environmental degradation.	Best shot to substantially reduce environmental degradation.

[0054] With respect to the vehicle fuels market, the crude oil market is dysfunctional. Oil price greatly exceeds crude oil cost (= finding cost + lift cost), and subsidies for fossil fuel projects and investments, plus lack of cost for externalities has resulted in a huge misallocation of capital. Substitute fuels or substitute vehicles reduce demand for crude oil. Oil price volatility and impact from 5+% substitution in the global markets drives down oil prices. Cost savings to customers greatly exceeds cost of substitute products capturing 5% of the oil products market. The present disclosure proposes to setup a green vehicle group (GVG) to invest in substitutes. This policy levies a crude oil tax (based on falling oil prices) to capture a fraction of the customer cost savings and uses the tax proceeds to fund GVG investments in substitutes.

[0055] The green vehicle group (GVG) strategy entails the formation of a jointly owned, independent company to promote initiatives and subsidies that will encourage growth in the green vehicle market. The strategy proposes and enacts policies to incentivize public and private companies to reduce crude oil consumption. Further, it uses the crude oil cost savings to reimburse the Green Vehicle Group's investments and subsidies. Fuel substitution decreases the fossil energy cost per mile driven by over 80%, although, investments in green vehicle manufacturing, battery storage, biofuels, and power distribution increase substantially as investments shift to these sectors.

Possible Green Vehicle Group members can include vehicle manufactures, battery manufacturers, power generators and distributors, cities and states and major oil companies.

[0056] The GVG strategy can help reduce crude oil demand. For instance, the strategy provides increased incentives to green vehicle manufacturers and marketers, reducing

green vehicle costs to customers. It increases green vehicle incentive to over $15,000 for PHEVs or EVs. There are also increased incentives substantially increase fleet penetration. It provide incentives to biofuel producers, increases, biofuel compensation 20-50% (received by biofuel producers), reduces biofuel prices to customers to less than gasoline or diesel, invests to deploy more fuel efficient vehicles, or alternate vehicles, and provides incentives to deploy electric motorcycles or scooters, or even bicycles. The strategy further expands and improves mass transit in key areas of the county, expands and improves high speed rail both short and long distances, and provides incentives for homeowners to switch from heating oil to heat pumps.

[0057] The strategy further contemplates to provide increased incentives to green vehicle manufacturers and marketers, reducing green vehicle costs to customers. Current green vehicle incentive is not attractive to many customers. Currently US tax credit maximum is about $7500 (California adds $2500 to max $10,000); current cost premium for green vehicles exceeds $20,000; current incentive reduces cost premium to customer to $12,500 (CA = $10,000). Average customer saves $1200-$1800 per year in fuel costs (6-10 year payout). The strategy proposes to increase green vehicle incentive to over $15,000, with higher incentive reduces cost premium to less than $5000, that would results in 3-4 year payout for customers.

[0058] The electricity market needs transition to reduced carbon sources. Conventional coal-fired power plants need to be shut down to reduce GHG emissions. Power market in 2040 should have 80% green power (solar, wind, geothermal,

biomass, and wave) and natural gas will be important stopgap generator source of energy. Shale gas is an opportunity to transition to green power sources. Government tax breaks and subsidies are not working well to ramp Green Power. Best customer costs result from Public Green Power projects. There is need for a Green Power Coalition to build Public Green Power projects and close down coal PPs. Government should give Public Green Power projects subsidies similar to private sector.

[0059] A Green Power Coalition (GPC) is a group of primarily publicly or cooperatively owned power providers that uses public financing to build a pipeline of green power projects. The GPC, in one aspect, receives 25-30% capital cost subsidies (similar to private power project subsidies). Private sector companies build and operate many of the green power projects. Private companies could be minority owners.

[0060] The GPC provides incentives for state and local governments and existing publicly owned electric power providers to build green power projects. Many states and local governments want to increase green power supply to reduce fossil fuel use. The GPC doesn't require that all states or local governments participate. It spreads the costs and benefits of developing of green power projects. Costs of green power should drop by 40-60% (or more) over a 20-30 year ramp. Continuous deployment is key to reducing costs and optimizing benefit to customers. Coalition members control investment allocation and project selection. Local control of project builds ensures projects address local/regional issues. This will creates a large market for green power project/technology developers.

[0061] The GPC provides alternative financial structures. Public entity ownership using 100% financing. One option is to use government owned operating company and another is government owned – company operated (GOCO) organization structure, which receives 25-30% capital cost subsidies (similar to private power project subsidies). Another alternative is joint public / private ownership which uses primarily public financing, plus some private investment, or uses 100% public financing, with

private company covering a portion of the annual debt payments in return for an ownership share. Another alternate ownership/ financing option: green power coalition owns projects and uses federal government loans to fund project. The green power coalition can receive pass-through government financing, the coalition agrees to build a pipeline build of green power projects, government agencies provide regulatory oversight of the Green Power Coalition, and a mix of public, cooperative, and private investors comprise the Green Power Coalition.

[0062] Green Power Coalition capital investments can ramp to $80-100B annually within ten years (approximately 40-60% of all green power investments), and hit $120-160B annually in 20 years, and could peak at at $200B in 30 years. The GPC investments can receive 25-30% capital cost subsidies (similar to private power project subsidies).

[0063] The investment ramp will depend on availability of debt financing and "need for speed." If AGW impacts worsen, then accelerate ramp. The GPC assesses and promotes green power technology development. Continuous deployment is key to reducing costs and optimizing benefit to customers. Energy efficiency and load shift projects can be part of GPC pipeline of projects. Investing in negawatts should generate high returns and reduce costs to customers. Green Power Coalition would be looking for best projects to reduce carbon emissions, so energy efficiency/conservation projects would easily compete for funding. The national transmission (grid) projects can be part of GPC pipeline, used to reduce dumped power from green power sources and supply peak green power across the country.

[0064] As a result of the green power ramp, the green power can seize over 80% of electricity market within thirty years. Coal fired power plants can be priced out of the market, or shut down due to regulatory issues. Natural gas plays key role as stopgap electric generation energy source, but doesn't simply replace coal. The green power ramp can cover retirement of nuclear plants.

[0065] Electricity costs to customers can fall to about 1.5% of household expenses (versus 2.6% currently), with lower consumption per unit of customer quality of life (QoL). Costs would fall more, but forecast uses high growth to increase customer QoL. Significant build-out of the national grid occurs, but costs decline anyway. Electricity costs as fraction of GDP falls to about 2% (versus 2.8% currently). GDP grows faster than electricity expenditures but electricity costs would fall to about 1% of GDP by 2060.

[0066] The natural gas market is busted, it is noted. Natural gas prices have fallen to $2.50, down from $5-$10 over the last eight years. Shale gas is an important stopgap supplement to Green Power sources through reserves, quickly. Natural gas is too valuable to produce and sell at such low prices, however. There is a need for new regulatory controls on Shale Gas development to slow down and curtail supply. It would be appropriate to hold shale gas acreage back from development for now and compensate leaseholders for slow shale gas development. The present disclosure proposes to levy a shale gas severance tax to address other economic and environmental concerns, select critical markets where natural gas provides a critical energy source, and substitute other energy sources or technology in non-critical markets. It also provides green energy subsidies for new facilities using green energy sources to reduce or replace natural gas demand.

[0067] One important strategy is to use natural gas only for critical end-markets where alternative energy sources don't make sense. It should discourage natural gas use for non-critical markets. Critical end-markets include, without limitation, stopgap electric power generation, industrial Fuel for high temperature heat source, petrochemical feedstock, back-up/supplement for heat pump space heating, oven/cooktop fuel. Non-critical end-markets include, without limitation, baseload and Peak Electric power generation, primary residential or commercial space heating or water heating, CHP (combined heat and power) systems.

[0068] The present strategy proposes to use state/regional energy standards to control natural gas power generation, use regional considerations to develop plan to shut down coal fired PPs and transition to green power and use natural gas as a transitional fuel, but reduce use of natural gas over the longer term. During transition to green power generation, it would phase out construction of natural gas turbine combined cycle power plants, support development of hybrid solar thermal/natural gas power plants using thermal energy storage systems, and place limitations on Combined Heat and Power (CHP) installations (consumes fossil fuel for non-critical application). A preferred approach is to use a solar thermal/geothermal CHP, with natural gas back-up.

[0069] The proposed green vehicle group and green power coalition can be combined. In that, it re-directs a portion of crude oil cost savings tax to fund green power projects. Tax recovering about 50% of crude oil price decline below the reference trend price can fund both increased green vehicle incentives and public green power project subsidies. Tax proceeds spit 60/40 would cover GVG incentives and GP Coalition projects.

[0070] This strategy can allow the GVG members to participate in the GPC, and vice versa, builds a much stronger set of companies and organizations to implement GV incentives and build GP projects. In some aspect, the combination can further include shale gas operators. Also, threat of actions to tax retained capital from previous fossil fuel industry tax subsidies can be balanced by redirecting investments into the combined Green Energy Group.

[0071] The following table shows the customer savings due to lower oil demand and lower oil prices, reflected in the overall cash balance for oil and vehicle markets, green vehicle group, and green power coalition.

15-year Program Cumulative Cashflow	15-yr Total	Indirect Cost Savings (due to lower oil prices)	6600
	$ Billion	Extra Incentives (GVs)	825

Direct Cost Savings (due to lower oil purchases)	**3500**	GVG Investor Cashflow (pay back investment w interest)	1157
Indirect Cost Savings (due to lower oil prices)	6600	Net Indirect Cost Savings Received by Oil Products customers	4618
Total Potential Cost Savings	10100	Cost of tax credits for GVs, if paid by crude oil tax	1030
Tax Credits (paid by US Govt.)	1030	Green Power subsidies paid by crude oil tax	821
Extra Incentives (GVs) - Paid by crude oil tax	825	Reduced Net Indirect Cost Savings	**2767**
		Total Cost Savings to Customers	**6267**

[0072] In the proposed strategy, oil companies can also benefit from this "Customers First" energy policy. Uncontrolled drop in oil price isn't in anyone's best interest. Green vehicle incentives could collapse oil prices. Oil companies could welcome efforts to control oil prices in the $40-50 per barrel range, if the alternative is a collapse below that level. Controlling natural gas prices back into the range of $4-5 per million BTU versus current prices of $2.50 benefits both customers and gas producers. Control natural gas price by limiting shale gas development. Removing tax subsidies on fossil fuel investments coupled with lower prices and shale gas restrictions will slow down oil and gas development, and ease constraints on capital (focus on most profitable opportunities). Threat of actions to tax retained capital from previous tax subsidies can be balanced by redirecting investments to green energy projects using low cost public financing.

[0073] There can be triggering events which should accelerate action. Continuing and persistent disruptive weather system events comprise the first important triggering event, increasing public and private efforts toward addressing AGW. Droughts, heat waves, severe precipitation events, even unusual cold spells, are being linked to Arctic amplification, in turn caused by AGW. The problem is serious enough to warrant immediate government action. Triggering events will increase the desire of Americans

for finding and funding a solution. Establishing the GV Group and the GP Coalition sets up a strong force advocating action on climate change. The GV Group and the GP Coalition should recommend setting up an emergency task force (ETF) to address this issue.

[0074] The "Customers First" energy policies described herein meet all critical customer needs better than the existing "Deny and Delay" Policies", or the "GHG Mitigation Policies". The customers first policies address each of all four overall critical needs (cost, environmental risks, economic impact, and national security) better than existing policies. The customers first policies use a pragmatic blend of private/public sector actions and regulations to improve customer satisfaction. Further, the customers first policies result in more rapid deployment of improved energy systems. Rapid deployment reduces risks. Leading-edge deployment puts America into a globally competitive position. Moreover, the customers first policies set the template for global policy makers. Major economies in Europe and Asia will likely implement similar energy policies. Eventually climate impacts and customer complaints would force implementation of the same end-solutions as "Customers First" policies, but with higher costs, and after putting customers into a higher risk environment.

[0075] It should be noted that although the discussions herein may refer to a specific order and composition of method steps, it is understood that the order of these steps may differ from what is described. For example, two or more steps may be performed concurrently or with partial concurrence. Also, some method steps that are performed as discrete steps may be combined, steps being performed as a combined step may be separated into discrete steps, the sequence of certain processes may be reversed or otherwise varied, and the nature or number of discrete processes may be altered or varied. The order or sequence of any element or apparatus may be varied or substituted according to alternative embodiments. Accordingly, all such modifications are intended to be included within the scope of the present invention. Such variations will depend on the software and hardware systems chosen and on designer choice. It is

understood that all such variations are within the scope of the invention. Likewise, software and web implementations of the present invention could be accomplished with standard programming techniques with rule based logic and other logic to accomplish the various database searching steps, correlation steps, comparison steps and decision steps.

[0076] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs.

[0077] The inventions illustratively described herein may suitably be practiced in the absence of any element or elements, limitation or limitations, not specifically disclosed herein. Thus, for example, the terms “comprising”, “including,” containing”, etc. shall be read expansively and without limitation. Additionally, the terms and expressions employed herein have been used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding any equivalents of the features shown and described or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

[0078] Thus, it should be understood that although the present invention has been specifically disclosed by preferred embodiments and optional features, modification, improvement and variation of the inventions embodied therein herein disclosed may be resorted to by those skilled in the art, and that such modifications, improvements and variations are considered to be within the scope of this invention. The materials, methods, and examples provided here are representative of preferred embodiments, are exemplary, and are not intended as limitations on the scope of the invention.

[0079] The invention has been described broadly and generically herein. Each of the narrower species and subgeneric groupings falling within the generic disclosure also form part of the invention. This includes the generic description of the invention with a

proviso or negative limitation removing any subject matter from the genus, regardless of whether or not the excised material is specifically recited herein.

[0080] In addition, where features or aspects of the invention are described in terms of Markush groups, those skilled in the art will recognize that the invention is also thereby described in terms of any individual member or subgroup of members of the Markush group.

[0081] All publications, patent applications, patents, and other references mentioned herein are expressly incorporated by reference in their entirety, to the same extent as if each were incorporated by reference individually. In case of conflict, the present specification, including definitions, will control.

[0082] It is to be understood that while the disclosure has been described in conjunction with the above embodiments, that the foregoing description and examples are intended to illustrate and not limit the scope of the disclosure. Other aspects, advantages and modifications within the scope of the disclosure will be apparent to those skilled in the art to which the disclosure pertains.

WHAT IS CLAIMED IS:

1. A method for forecasting a price for a traded fixed price commodity for a forecast period, comprising:

(A) obtaining retrospective data regarding the past cost of the commodity for a predetermined time period and determining average price trend for the commodity in terms of annual percentage increase; or alternatively, fitting the cost data with a trend line using predetermined fitting methods, and calculating the average price trend in terms of annual percentage increase;

(B) determining the average price for the commodity over a recent shorter time period to obtain a base price for the forecast period; or alternatively, using the trend line reading at the beginning of the forecast period to set the base price;

(C) multiplying the base price from step (B) by the annual percentage increase calculated in step (A) and adjusted to represent the length of the next time period, to set the reference price for the next time period; then escalating reference prices for successive time periods by applying the annual percentage increase from step (A) adjusted for time period length, for each predetermined future time period to set the reference price forecast; and

(D) optionally adjusting the reference price forecast lower to reflect a maximum price annual percentage increase lower than the price trend average annual percentage increase calculated in step (A),

wherein at least one step of (A)-(D) is performed by a computer.

2. The method of claim 1, further comprising periodically collecting the trade price data to calculate the average price during the most recent price period; then subtracting this trade average price from the forecast reference price to calculate the price reduction; then multiplying this price reduction by the total amount of commodity

consumed over the time period, to calculate the estimated annual cost savings to customers due to the improved commodity price.

3. The method of claim 2, further comprising setting compensation for an intervener in the commodity market, whose activities, investments, and expenditures provided and promoted substitute materials, systems, and practices, to reduce commodity demand; and wherein said compensation is set proportional to the amount of estimated annual cost savings to the fixed price commodity customers, using a predetermined formula to calculate the compensation using the annual cost savings as input to the formula.

4. The method of claim 3, further comprising using an organization to provide regulatory oversight of the compensation determination, said organization with the ability to modify the calculations and input to the calculations, used in the methods of claim 3; wherein the regulatory oversight optionally may be able to evaluate measures of profitability, levels of investment, and timing of investments and expenditures and compensation payments, in order to adjust compensation to the intervener.

5. The method of claim 4, further comprising using the organization conducting regulatory oversight of compensation, to also conduct regulatory oversight to assess and determine how each of the intervener's actions has affected externalities, including environmental impact, economic benefits, and national and global security issues.

6. A system comprising a processor, memory and program code which, when executed by the processor, configures the system to forecast a price for a traded fixed price commodity for a forecast period by:

(A) obtaining retrospective data regarding the past cost of the commodity for a predetermined time period and determining average price trend for the commodity in terms of annual percentage increase; or alternatively, fitting the cost data with a trend

line using predetermined fitting methods, and calculating the average price trend in terms of annual percentage increase;

(B) determining the average price for the commodity over a recent shorter time period to obtain a base price for the forecast period; or alternatively, using the trend line reading at the beginning of the forecast period to set the base price;

(C) multiplying the base price from step (B) by the annual percentage increase calculated in step (A) and adjusted to represent the length of the next time period, to set the reference price for the next time period; then escalating reference prices for successive time periods by applying the annual percentage increase from step (A) adjusted for time period length, for each predetermined future time period to set the reference price forecast; and

(D) optionally adjusting the reference price forecast lower to reflect a maximum price annual percentage increase lower than the price trend average annual percentage increase calculated in step (A).

FIG. 1

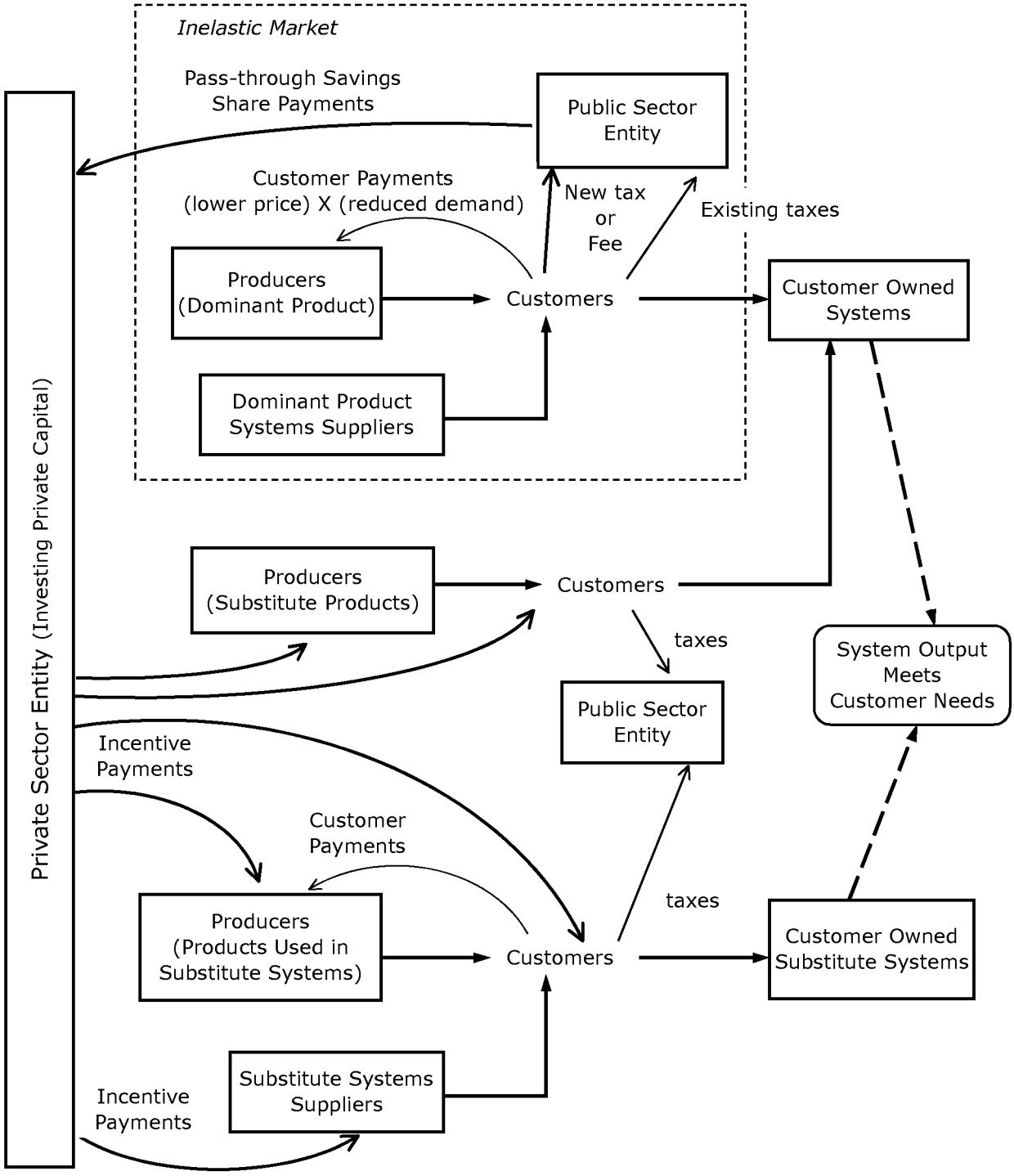

Inelastic Market
Pass-through Savings Share Payments
Public Sector Entity
Customer Payments (lower price) X (reduced demand)
New tax or Fee
Existing taxes
Producers (Dominant Product)
Customers
Customer Owned Systems
Dominant Product Systems Suppliers
Private Sector Entity (Investing Private Capital)
Producers (Substitute Products)
Customers
taxes
Public Sector Entity
System Output Meets Customer Needs
Incentive Payments
Customer Payments
Producers (Products Used in Substitute Systems)
Customers
taxes
Customer Owned Substitute Systems
Substitute Systems Suppliers
Incentive Payments

FIG. 2

"SOA"

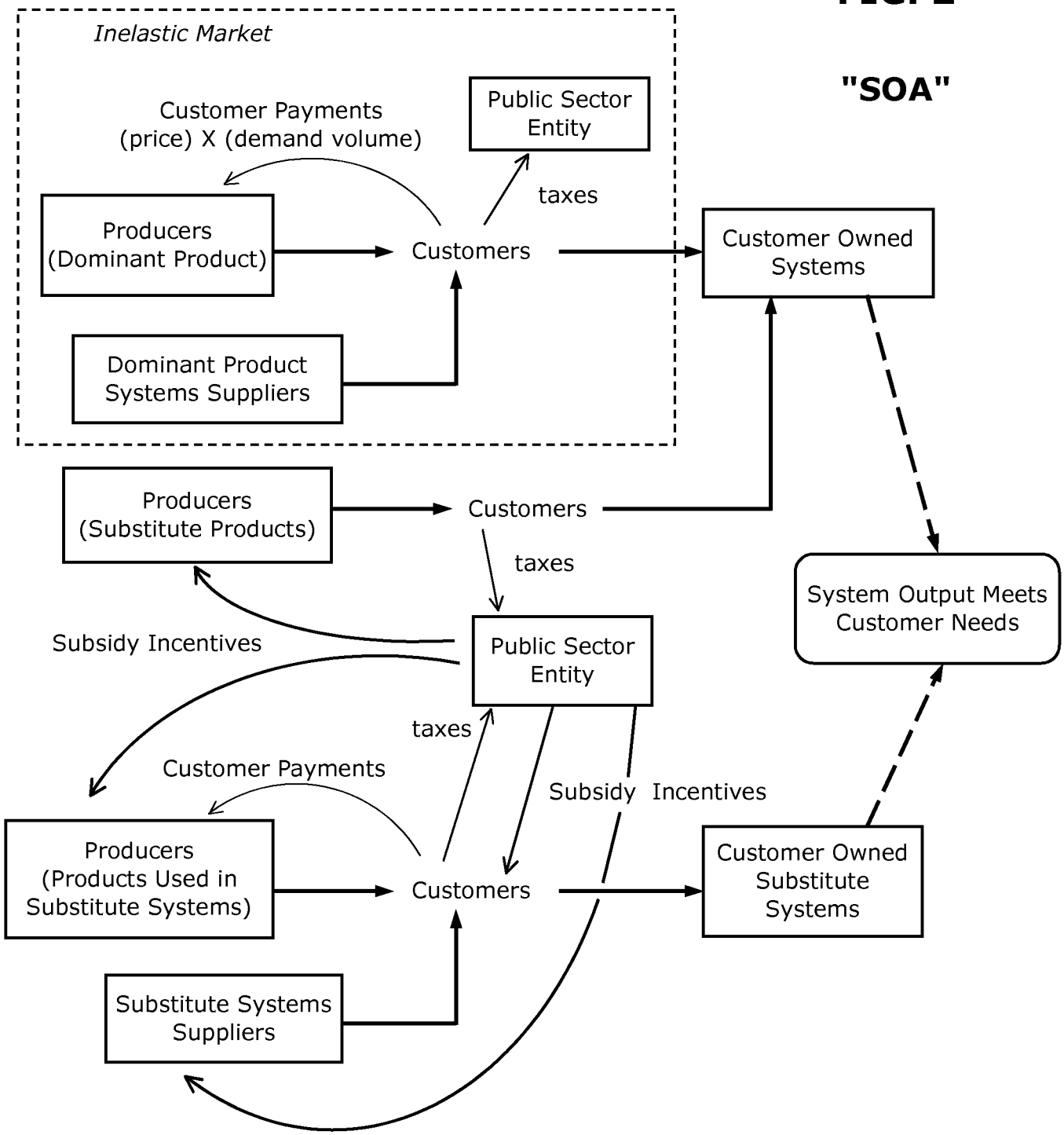

Inelastic Market
Customer Payments
(price) X (demand volume)
Public Sector Entity
taxes
Producers
(Dominant Product)
Customers
Customer Owned Systems
Dominant Product Systems Suppliers
Producers
(Substitute Products)
Customers
taxes
System Output Meets Customer Needs
Subsidy Incentives
Public Sector Entity
taxes
Customer Payments
Subsidy Incentives
Producers
(Products Used in Substitute Systems)
Customers
Customer Owned Substitute Systems
Substitute Systems Suppliers

FIG. 3

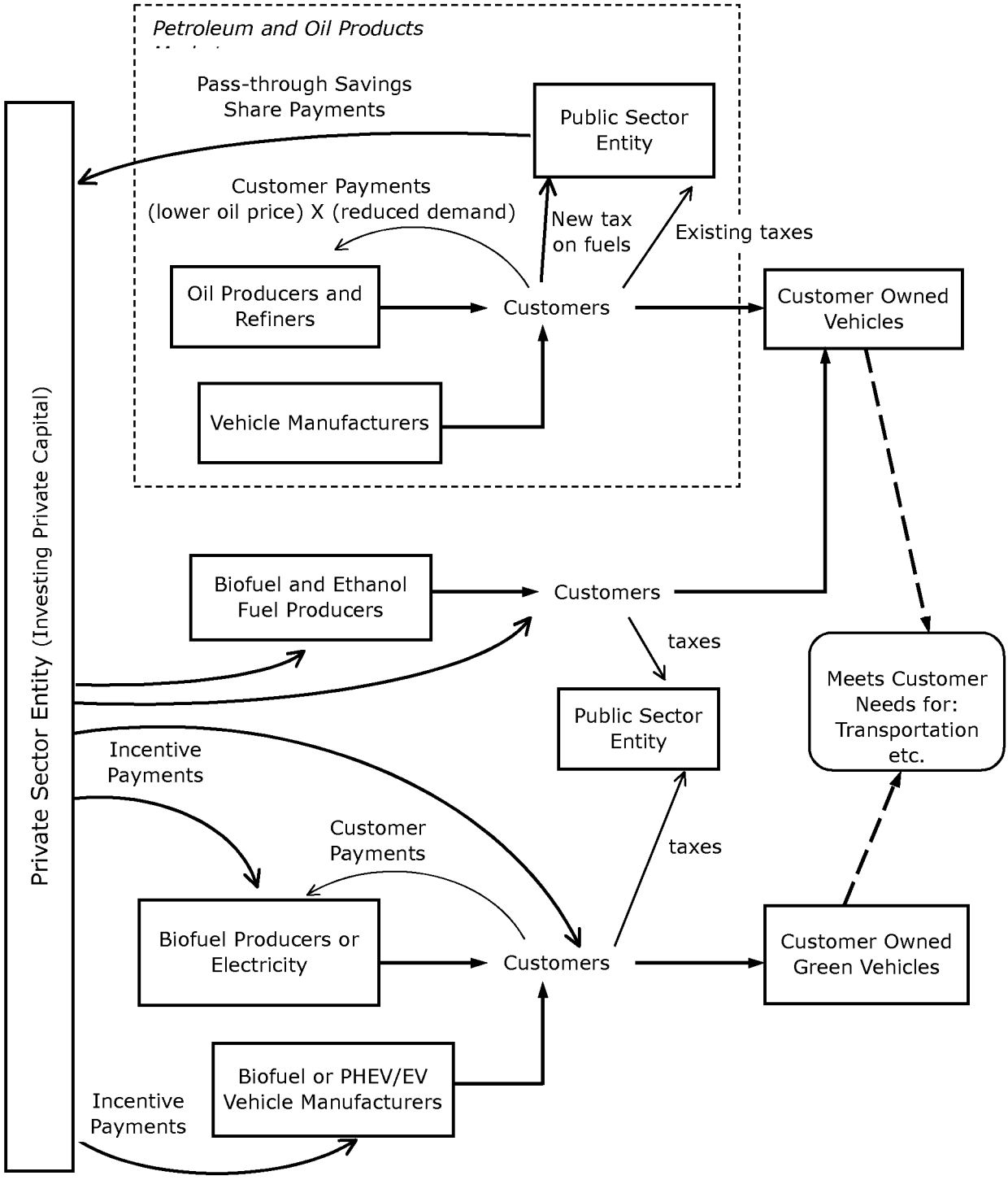

Petroleum and Oil Products
Pass-through Savings Share Payments
Public Sector Entity
Customer Payments (lower oil price) X (reduced demand)
New tax on fuels
Existing taxes
Oil Producers and Refiners
Customers
Customer Owned Vehicles
Vehicle Manufacturers
Private Sector Entity (Investing Private Capital)
Biofuel and Ethanol Fuel Producers
Customers
taxes
Public Sector Entity
Meets Customer Needs for: Transportation etc.
Incentive Payments
Customer Payments
taxes
Biofuel Producers or Electricity
Customers
Customer Owned Green Vehicles
Biofuel or PHEV/EV Vehicle Manufacturers
Incentive Payments

FIG. 4 **Crude Oil: Price Elasticity to Reduced Demand**

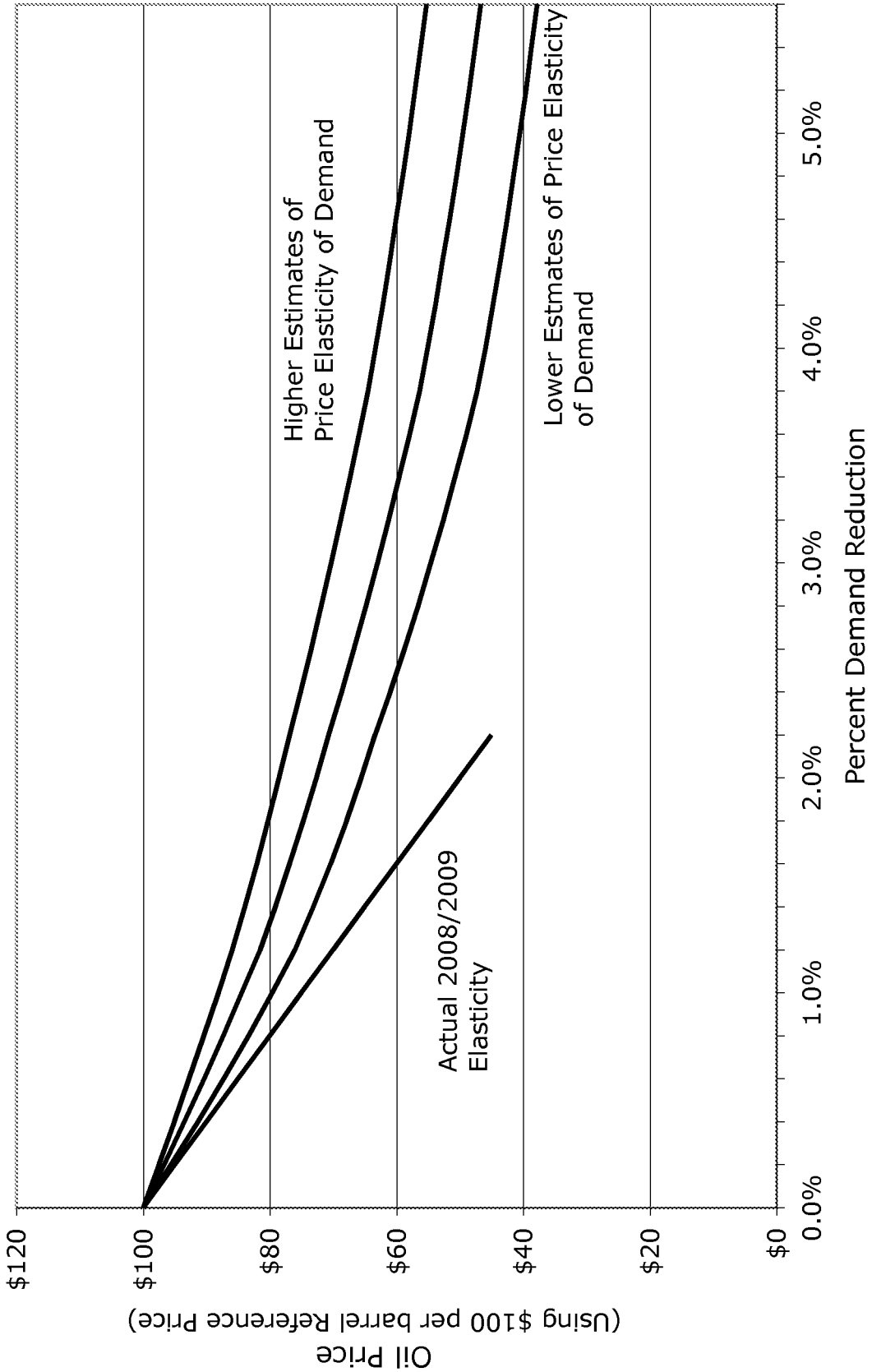
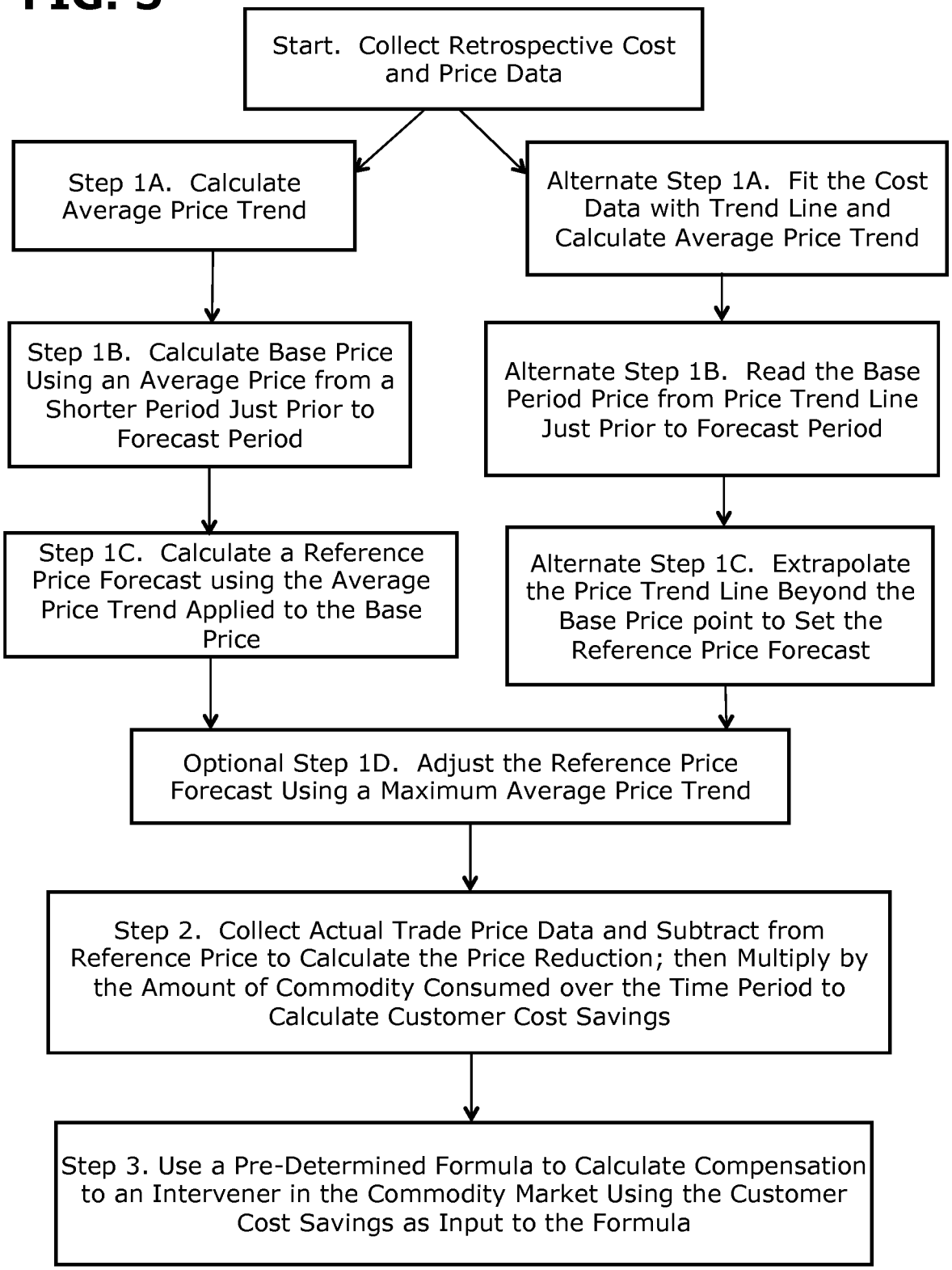


FIG. 5


Start. Collect Retrospective Cost and Price Data
Step 1A. Calculate Average Price Trend
Alternate Step 1A. Fit the Cost Data with Trend Line and Calculate Average Price Trend
Step 1B. Calculate Base Price Using an Average Price from a Shorter Period Just Prior to Forecast Period
Alternate Step 1B. Read the Base Period Price from Price Trend Line Just Prior to Forecast Period
Step 1C. Calculate a Reference Price Forecast using the Average Price Trend Applied to the Base Price
Alternate Step 1C. Extrapolate the Price Trend Line Beyond the Base Price point to Set the Reference Price Forecast
Optional Step 1D. Adjust the Reference Price Forecast Using a Maximum Average Price Trend
Step 2. Collect Actual Trade Price Data and Subtract from Reference Price to Calculate the Price Reduction; then Multiply by the Amount of Commodity Consumed over the Time Period to Calculate Customer Cost Savings
Step 3. Use a Pre-Determined Formula to Calculate Compensation to an Intervener in the Commodity Market Using the Customer Cost Savings as Input to the Formula

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 13/59031

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06Q 30/00 (2013.01)
USPC - 705/400
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC (8) - G06Q 30/00 (2013.01)
USPC - 705/400

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - 705/1.1, 705/7.35, 700/291, 705/412 (See Keywords Below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Thomsoninnovation.com; Patbase; Google Scholar; Google Patents; Gogole.com; Freepatentsonline; ProQuest Dialog
Search Terms: estimate, forecast, project, price, cost, value, commodity, item, merchandize, goods, electric, gas, financial instrument, investment instrument, annual percentage, rate, change, increase, decrease, time, period, window, mul

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004/0128261 A1 (OLAVSON et al.), 01 July 2004 (01.07.2004), entire document, especially Abstract; para [0009], [0043], [0133], [0135]-[0138]	1-6
Y	US 8,140,381 B2 (WU et al.), 20 March 2012 (20.03.2012), entire document, especially Abstract; col 14, ln 58 to col 16, ln 10	1-6
Y	US 2007/0203814 A1 (DI FLORIO et al.), 30 August 2007 (30.08.2007), entire document, especially Abstract; para [0023]-[0025], [0075]-[0077]	2-5
Y	US 2004/0225514 A1 (GREENSHIELDS et al.), 11 November 2004 (11.11.2004), entire document, especially Abstract; para [0030]-[0032], [0045]-[0047], [0061], [0075]-[0077]	3-5
A	US 2005/0144061 A1 (RARITY et al.), 30 June 2005 (30.06.2005), entire document	1-6
A	US 2008/0027806 A1 (MARTINE et al.), 31 January 2008 (31.01.2008), entire document	1-6
A	US 2011/0071882 A1 (JAKAGNANAM et al.), 24 March 2011 (24.03.2011), entire document	1-6

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
10 December 2013 (10.12.2013)	10 JAN 2014
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774