

SYSTEM AND METHOD FOR SHARIA-BASED ENERGY MARKET HEDGING AND RELATED

CROSS-REFERENCE TO RELATED APPLICATIONS

5 **[0001]** This application is a PCT International Application and claims the benefit of U.S. Provisional Application No. 61/810063 filed on April 9, 2013. The entire disclosure of the above application is incorporated herein by reference.

FIELD

10 **[0002]** The present teachings generally pertain to systems and methods for commodities trading, and more particularly to systems and methods for creating a Sharia compliant energy trading platform for executing Sharia compliant trades and Sharia compliant market hedging.

INTRODUCTION

15 **BACKGROUND**

[0003] The statements in this section merely provide background information related to the present disclosure and may not constitute prior art.

[0004] Global Energy e-Bourse (the “Exchange”) is an electronic trading platform which facilitates the hedging of financial risks caused by energy market price movements, *inter alia* those associated with crude oil and refined products exported by
20 state-owned oil companies in the Middle East (“ME”) to customers in the growing East of Suez (“ES”) market corridor.

[0005] Many buyers and sellers of ME/ES crude oil and refined products reside and/or conduct business in countries where the Muslim community comprises a
25 substantial or dominant part of the population. At present there are over 1.7 billion Muslims amounting to 23% of the global populace (and a much larger share in the ME/ES market corridor), many of whom strive to abide by principles conforming to

religious values and beliefs based on Sharia (Islamic Law). To Muslims, the notion of employing commodity trading and derivatives solutions for legitimate hedging purposes based on Sharia (Islamic Law) has gained acceptance within a rapidly evolving field of global commerce. The present disclosure aims to advance the art in that field by establishing an outlet for Sharia-based versions of the energy market hedging system, method and instruments taught in U.S. Patent Application Serial No. 13/558,974, and as will be more fully described herein.

[0006] The present application provides background information on relevant aspects of Sharia and cites cases of Sharia-based commodity trading platforms and derivatives solutions currently in the field. The present disclosure further assesses the future direction of Sharia-based financial innovation that could benefit the field and, lastly, describes the proprietary system and method by which transactions involving the Exchange's instruments, as detailed herein, are uniquely designed to meet substantive Sharia compliance tests while aiming to benefit both the global energy market and the Islamic finance and investment market.

[0007] It will be understood that Sharia, the moral code and religious law of Islam, deals with topics addressed by secular law (e.g., crime, politics, economics), as well as personal matters (e.g., prayer, diet, fasting, hygiene, sex). As part of the process Sharia identifies and promotes economic order conforming to Islamic scripture and traditions. In the last decade or so major initiatives have been undertaken to ensure that Sharia-based economic order remains intact within a rapidly changing financial world. That requires ongoing financial innovation to coincide with core Islamic principles aimed at reducing the gap between rich and poor by encouraging trade, discouraging the hoarding of wealth and prohibiting the practice of usury (riba).

[0008] There are two Primary Sources of Sharia law. The first involves the precepts set forth in the Koran (Quran), Islam's religious text, which Muslims consider the verbatim word of God (Allah) as revealed to the Prophet Muhammad by the angel Gabriel. The second involves examples set by Muhammad in the Sunnah, recordings of the Prophet's specific words, habits, practices and silent approvals, all of which

prescribe life lessons to deal with such matters as those involving family, friends, communities, businesses and governments.

[0009] In jurisdictions where it has official stature, Sharia is interpreted by Islamic judges (qadis) with varying responsibilities for the religious leaders (imams). In cases not directly addressed by Primary Sources, Sharia is subjected to human interpretation of its laws (fiqh) through the conduct of religious scholars (ulama) thought to embody the consensus of the Muslim Community (ijma).

[0010] Following is a summary of principles and factors that are relevant to the Exchange's electronic trading platform designed for Sharia-based hedging of energy market price movements, including but not limited to those associated with ME/ES crude oil and refined products, starting with what is generally prohibited:

[0011] **Gharar** (uncertainty in contracts) may apply to the sale of an item whose existence or characteristics are not certain, and upon contractual terms that are ambiguous or unclear; this may include contracts, which contain obligations to insure another person or grant an option to purchase an asset.

[0012] **Maisir** (gambling) may apply to certain dealings in conventional futures and options markets to the extent that they are deemed to be speculative in nature.

[0013] **Haram** (prohibited commodity or activity) pertains primarily to pork, alcohol and gambling services.

[0014] Common practices generally deemed permissible are noted next:

[0015] **Murabaha** (form of Islamic financing) involves Party A (typically an Islamic Bank) buying a desired physical commodity (e.g., crude oil) at a certain cost and then selling it to Party B (typically a bank customer) at a cost-plus-profit basis. Party B will then pay back the amount, plus the agreed-upon profit, to Party A on a deferred payment basis.

[0016] **Tawarruq** (financing solution providing desired liquidity) involves two stages (i) Murabaha Stage whereby Party A (Islamic Bank) and Party B (bank customer) enter into a commodity contract, which results in Party B owning the underlying

commodity either physically or constructively; and (ii) Asset Liquidation Stage where Party B can sell/liquidate the commodity either directly in the spot market or through an agency agreement employing Party A.

5 **[0017] Musawama** (Islamic trade) involves both Seller and Buyer negotiating the selling price of a commodity without Buyer knowing the actual cost of the commodity. In order for the trade to be Sharia compliant, three conditions must be met: (i) the underlying commodity must be owned by Seller prior to the trade, (ii) the sale must take place at the time of the commodity trade, rather than some date in the future and (iii) the commodity must be valuable and usable.

10 **[0018] Wa'ad** (promise) is somewhat similar to a social promise in Common Law. In those cases, wa'ad may have moral consequences in that its breaking could provoke social blame but perhaps not entail legal obligations or sanctions. However, the Islamic Fiqh Academy has decided that wa'ad is obligatory not only in the eyes of God but also in a court of law when (i) made as part of a commercial transaction; (ii) it is
15 a unilateral promise; and (iii) causes the Promisee to incur liabilities. Another ruling indicates that if wa'ad is made as part of an asset sale completed at majlis al-aqud (point when there is both an exchange of an offer and its acceptance), then the timing of the wa'ad takes a back seat. In such cases, the Promisee is able to claim actual damages against the Promisor if the latter backs out of a wa'ad.

20 **[0019] Tahawwut** (hedging) involves each party issuing an undertaking to enter into a contract in the future for the sale of assets following the designation of an early termination date. Under Sharia principles, the tahawwut must be strictly linked to underlying transactions and cannot, itself, be a transaction conducted for the sole purpose of making money from money.

25 **[0020]** Salam is a contract whereby its partners deal with each other in a transaction involving a future obligation (e.g., the deferred physical delivery of a halal commodity), which must be reduced to writing (per Surah Al Baqari Verse 282) and done so on the basis of specified weight and scale. In the context of one embodiment of this invention, Salam-style energy transactions match the bilateral interests of

Exchange-For-Physical (“EFP”) buyers and sellers having practically, rather than absolute, opposite hedging interests, thereby generating a structure that meets the bona fide commercial objectives of fuel producers, refiners, importers and exporters, plus Islamic banks and investors. To that end, the protection seller may be required to
5 own the referenced asset at the inception of each transaction, the price of which should be negotiated and executed by the counterparties on the spot (i.e., trade date).

Recent Landmark Events

[0021] In recent years, there have been two landmark events in the field
10 (noted directly below): one involving a Sharia-based commodity trading platform and another that provides standardized over-the-counter (“OTC”) derivatives agreements sanctioned for trade.

[0022] Bursa Malaysia through its wholly-owned subsidiary, Bursa Malaysia Islamic Services Sdn. Bhd., launched Bursa Suq Al-Sila (“BSAS”) in August 2009.
15 Originally known as the Commodity Murabahah House, BSAS became the world’s first Shariah-based commodity trading platform through collaborative efforts of Bursa Malaysia, Bank Negara Malaysia (Central Bank), the Securities Commission of Malaysia and a host of industry players in support of the Malaysia International Islamic Financial Centre Initiative. BSAS’s initial underlying commodity, crude palm oil, was later joined
20 by plastic resin and Rbd palm olein. As inferred by its original name, BSAS embraces the commodity Murabaha concept.

[0023] The ISDA/IIFM Tahawwut Master Agreement (“TMA”) and its accompanying Explanatory Memorandum were completed in March 2010 through collaborative efforts of the International Swaps and Derivatives Association and the
25 International Islamic Financial Market. Holding the distinction of being the first globally standardized document approved for privately negotiated Islamic hedging transactions, as well as the first sanctioned in all jurisdictions where Islamic finance is practiced, the TMA *inter alia* deals with the complexities and costs associated with OTC derivatives agreements. A prior lack of such documentation was viewed as a substantial

impediment to prospects for the Islamic finance and investment market's further development.

[0024] The TMA expressly contemplates parties entering into underlying Sharia-based transactions, e.g., Murabaha. Given that those transactions typically call for financing parties to take title to the asset in question, financing parties are exposed to commercial risk until their counterparties can ultimately sell/liquidate the asset. To hedge that commercial risk under Sharia, one party undertakes to enter into a transaction in the future at the election of the other party, with said undertaking comprising a wa'ad. The TMA contemplates two distinct sets of wa'ad, noted below:

(i) to enter into designated future transactions ("DFT") between the parties, usually contained in a DFT Confirmation that is part and parcel to a DFT Terms Agreement; and

(ii) to enter into Musawama in the event of an early termination date.

[0025] Although the TMA is described as Sharia compliant, it requires standard representations by each party containing the following caveats: "Insofar as [a party] wishes or is required for any reason to enter into transactions which are Sharia compliant it has made its own investigation into and satisfied itself as to the Sharia compliance of this Agreement (including the declaration, pronouncement, opinion or other attestation of the Sharia adviser, board or panel relevant to it where required)". Thus, the TMA is not intended to supplant the need for an opinion from a Sharia ruling body, where required.

[0026] In some respects, the TMA's emergence has helped demystify Islamic finance and investment markets by providing generally accepted market documents as the basis for new standards. However, the TMA requires close monitoring since ever-evolving market issues will inevitably arise so as to effect its future application and thus merit careful evaluation. In any event, the TMA will undoubtedly serve well as a benchmark for further standardized documentation as its adherents endeavor to insure that Islamic finance and investment markets keep pace with innovations in the field of global commerce.

Future Direction of Sharia-Based Financial Innovation

[0027] Advancing the impact of the landmark events noted above with ongoing Sharia-based financial innovation is pretty much assured for reasons that are well documented in a March 2012 International Monetary Fund working paper authored by Andreas Jobst and Juan Sole', entitled *Operative Principles of Islamic Derivatives – Toward a Coherent Theory*.

[0028] As posited in the IMF working paper's conclusion, in light of the \$1 trillion (and growing) base of assets lodged in Islamic financial instruments and capital markets, the relatively swift post-crisis [Great Recession] recovery of demand for Sharia compliant structured transactions points to real demand for religiously accepted risk management solutions. The scarcity of Sharia-based instruments to hedge risks arguably comes at an inauspicious time for many Islamic financial institutions as they move to expand activities beyond their original jurisdictions. International diversification of Islamic banking activities will certainly require new and more flexible instruments to better manage price risks that are attendant to underlying assets.

[0029] As Islamic finance comes onto its own, and more companies turn to market-based sources of finance, Sharia-based derivatives contracts are expected to become increasingly useful tools to enhance liquidity management, supplement cash markets at lower funding costs, and ensure an efficient transmission of funds from savers to investors. But despite the landmark events of recent years, derivatives in Islamic finance are still very much contested. That is attributed to the fact that some fundamental features of contemporary (or conventional) derivatives – e.g., uncertainty of pay-off, absence of risk sharing, and the potential of speculative use (or abuse) -- are not accepted in the tradition of Islamic finance.

[0030] Arguably, the restrictive treatment of derivatives under Sharia law seems to deprive Islamic financial institutions of the many advantages derivable from risk transfer mechanisms. Despite the recent advances noted, transparency and risk

management practices are still far from being fully developed. The opinion of Sharia scholars is an added consideration that policy makers and regulators in Islamic countries must take into account. Thus, to better leverage the impact of recent landmark events, which certainly represented first steps in the right direction, other risk management techniques are required to advance the art and more broadly reflect core Sharia principles, which in the case of this application supports the rationale behind Sharia-based hedging of energy market price movements, as described herein.

[0031] As further posited by Andreas Jobst in March 2008's Hedge Fund Monthly, entitled *Derivatives in Islamic Finance*, implicit forward elements in Islamic finance, much like the forwards in conventional finance, involve double coincidence and counterparty risk that are inherent to privately negotiated customization. Parties to such forward agreements need to have exactly opposite hedging interests, which coincide with the timing of protection sought against adverse price movements, as well as the quality and quantity of asset delivery.

[0032] OTC forward contracts elevate the risk of counterparty default when an underlying asset's spot price falls below its forward price prior to maturity, rendering the contract "out-of-the-money" and making deliberate default more attractive. In the realm of Islamic finance, such events may trigger a variety of legal remedies (including litigation), the enforcement of which may be lengthy, cumbersome and expensive, especially in areas of conflicting legal governance (commercial law versus Islamic law).

[0033] The obvious shortcomings of privately negotiated OTC forwards create the economic rationale for exchange-traded futures contracts, which *inter alia* require margin calls and standardized terms of size, quality and maturity, all of which are designed to alleviate the constraints of double coincidence common in forward contracts. However, certain generic aspects unique to conventional futures contracts appear to contravene Shariah principles in the way they limit counterparty risk.

[0034] Conventional futures are generally priced daily on a mark to market ("MTM") basis, which requires margin calls from the party that is out-of-the-money. Since the absence of underlying asset transfer renders MTM pricing unacceptable under

Sharia law, one possible solution to this problem (per Jobst) could involve marginal adjustments being made to scheduled Murabaha repayments in the event of material declines in the underlying asset's market value from its pre-agreed strike price at different points until maturity.

5 **[0035]** Another possible solution involves entailing the use of conventional options. However, this solution does not only serve to hedge adverse price movements so much as it removes exposure to contingency risks (primarily those of discretionary non-performance) implied in contemporary futures, all of which is received in exchange for an up-front, non-refundable premium payment. Option use, of course, also
10 provides opportunities to take advantage of favorable price movements.

[0036] While the premise of eliminating contingency risk is desirable under Islamic law, the assurance of definite performance through cash settlement (in futures) or mutual deferment (in options) terms commonly contained in conventional derivatives contracts is not. This is because it supplants the traditional Islamic finance
15 concept of direct asset recourse and otherwise implies a generic zero-sum (rather than bilateral interest) proposition.

[0037] Jobst offers a way to narrow the conceptual gap noted above. By holding equal and opposite option positions with the same strike price, both parties could still be obliged to honor the terms of their underlying asset-backed contract
20 irrespective of any periodic change in the asset's market value. The sequence of periodic and maturity-matched put and call combinations (with zero-cost structure) would then preserve the type of equitable risk sharing that is consistent with Sharia principles applicable to entrepreneurial investment.

[0038] Perhaps the most adroit conclusion shared by Jobst is that
25 conventional futures and options are rejected by a majority of Islamic scholars on the grounds that the delivery of commodities or their possession (qabd) is not intended in most cases. With all due respect, that is almost precisely the case for energy futures and options traded at the New York Mercantile Exchange ("NYMEX"), a subsidiary of Chicago-based CME Group, as well as the IntercontinentalExchange ("ICE") in London,

which together have evolved into a de-facto duopoly in the field of exchange-traded energy market derivatives.

[0039] NYMEX exploits futures and options contracts centered round a landlocked U.S. crude oil benchmark called West Texas Intermediate (“WTI”). ICE, on the other hand, exploits futures and options centered round a waterborne benchmark known as Brent, a blend of North Sea crudes. Each is claimed by exchange promoters to be a “global” benchmark, which arguably may be superficially valid but only if the criteria is gauged around average daily volume (“ADV”) trading statistics.

[0040] During 2012, the reported ADV of WTI futures (1,000 barrels of crude per contract) traded at NYMEX exceeded 600,000, a level close to ICE’s reported ADV for Brent futures. That means well over 300 billion barrels of gross national crude oil were subjected to NYMEX + ICE trading, a staggering level that exceeded actual WTI + Brent crude production output by a factor of more than 400-to-1 (amounts annualized). In a sheer statistical sense, virtually all parties reversed their transactions and cash settled the price difference only, a practice which in the eyes of an Islamic scholar essentially transforms a derivative contract into a paper transaction without any of the elements of a genuine sale involving physical delivery and possession.

[0041] Reaching a staggering trade-to-production multiple like 400-to-1 would be impossible without substantial interests of commodity speculators who never intend to take delivery. Ergo, the mega-trillion dollar question that fuels global consternation, not only from Islamic scholars but by the growing scores of commercial and consumer interests threatened, directly or indirectly, by the enormity of speculator influence: do they (speculators) merely provide valuable liquidity to the markets or have they essentially transformed the NYMEX and ICE (not to mention other major exchanges) into gambling casinos?

[0042] Influence of speculator interests on commodity prices, along with related exchange and regulatory oversight, have been increasingly controversial, if not heated, topics for years. More recently, tangential issues pertaining to high-frequency trading (“HFT”) – a method of using super-computers and complex algorithms

demanding micro-second (and less) execution by exchanges, requiring constant investment in new and advanced computer technology to gain/maintain an edge over other traders -- has stirred the pot even more. Media reports estimate that HFT not only accounts for well over half of the reported trades at major exchanges but the vast majority of all bids and offers, which tend to be aggressively and systematically entered and then pulled back in such notorious HFT practices known as "spoofing", "flash trading" and "quote stuffing". HFT, alone is arguably the quintessential excuse for a Sharia-based censure of conventional futures and options use.

[0043] As a result, It seems only reasonable that an Islamic scholar would censure WTI and Brent futures and options traded at NYMEX and ICE since they (i) almost never involve delivery by their contracts' counterparties and (ii) are too dissimilar compositionally (in terms of API gravity and sulfur content), not to mention geographically, to serve as quasi-proxies for the actual physical grades of ME crude oil typically exported to the ES energy market corridor, which is heavily populated by the Muslim community.

[0044] Despite the factors noted above, it must be emphasized that not every aspect or feature embodied in a conventional exchange-traded futures or options contract is anathema to the notion of legitimate Sharia-based risk management, which is arguably needed now more than ever in the increasingly sophisticated fields of Islamic finance and investment. The next two sections of this application teach how certain exchange-traded energy market derivatives can be efficiently employed in an innovative manner while still satisfying substantive Sharia compliance tests.

SUMMARY

[0045] In one aspect the present disclosure relates to a computerized exchange-traded derivatives based hedging system to match, execute and settle buy and sell orders placed over an exchange-controlled network by physical delivery-oriented counterparties seeking to manage future energy price volatility risks via

transparent centralized trading of commodities possessing qualifying properties within the bounds of exchange benchmark-specified sets of fuels. The may comprise:

[0046] at least one processor configured to run a plurality of non-transitory, machine executable instructions;

5 **[0047]** at least one memory in communication with the processor, the memory configured to store the non-transitory, machine executable instructions which when running on the processor are configured to:

[0048] collect data for a plurality of fuels, wherein the data include geographic locations where the fuels are discovered, a rate of extraction of the fuels,
10 and properties of the fuels;

[0049] select fuels from the plurality of fuels based on the properties of the fuels to generate sets of fuels comprising fuel commodity benchmarks;

[0050] generate weights for generating weighted averages, wherein a weight for generating a weighted average for a fuel in a set is based on a rate of
15 extraction of the fuel relative to an aggregate rate of extraction of the fuels in the set;

[0051] generate the fuel commodity benchmarks indicating aggregate qualities of the sets of fuels, wherein a fuel commodity benchmark for a set of fuels is generated based on weighted averages of the properties of the fuels in the set of fuels;

[0052] communicate the fuel commodity benchmarks to traders and that
20 receives orders for derivatives contracts from the traders to buy or sell derivatives contracts based on the fuel commodity benchmarks; and

[0053] wherein the order for derivatives contracts based on differences between actual properties of the fuel to be physically delivered under terms of an operative derivatives contract and aggregate qualities indicated by the fuel commodity
25 benchmark is processed by an algorithm stored in the memory and running on the processor, the algorithm employed to compute a requisite number of long or short complementary index contracts taking into consideration attendant fuel quality variability including at least one of specific API gravity and sulfur content, with said

contracts being executable for co-delivery on a settlement date of the operative derivative contract.

[0054] In another aspect the present disclosure relates to a method that may comprise:

5 using a processor running non-transitory machine executable instructions, and in communication with a memory, to:

collect data for a plurality of fuels, wherein the data include geographic locations where the fuels are discovered, a rate of extraction of the fuels, and properties of the fuels;

10 select fuels from the plurality of fuels based on the properties of the fuels to generate sets of fuels comprising fuel commodity benchmarks;

generate and store in the memory weights for generating weighted averages, wherein a weight for generating a weighted average for a fuel in a set is based on a rate of extraction of the fuel relative to an aggregate rate of extraction of
15 the fuels in the set;

generate and store in the memory the fuel commodity benchmarks indicating aggregate qualities of the sets of fuels, wherein a benchmark for a set of fuels is generated based on weighted averages of the properties of the fuels in the set of
fuels;

20 communicate the benchmarks to traders and receiving orders for derivatives contracts for the fuels from the traders based on the benchmarks; and

process an order for derivatives contracts based on differences between actual properties of the fuel to be delivered under the terms of an operative derivatives contract and the aggregate qualities indicated by an operative fuel commodity
25 benchmark.

[0055] Further areas of applicability will become apparent from the description provided herein. The description and specific examples provided herein are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

DRAWINGS

[0056] The present teachings will become more fully understood from the detailed description, the appended claims and the following drawings. The details within the various views of the drawings will be understood to be drawn generally to scale. In the drawings:

[0057] Figure 1 illustrates the trading exchange data flow patterns using a system for energy market hedging in accordance with the present teachings;

[0058] Figure 2 depicts examples of data regarding various crude oils produced in the Middle East, which underlie the aforementioned crude oil benchmarks and are subject to change from time to time;

[0059] Figure 3 is a functional block diagram of a system for energy market hedging in accordance with the present teachings;

[0060] Figure 4 is a functional block diagram of a computing device;

[0061] Figure 5 is a functional block diagram of a server for the system of Figure 3;

[0062] Figure 6 is a flowchart of a method for energy market hedging in accordance with the present teachings;

[0063] Figure 7 is a high level block diagram of one example of a Sharia compliant energy commodity trading and risk hedging system in accordance with the present disclosure, and showing how the Sharia compliant system may be incorporated into a secure, web-based Cloud network serving both the Exchange and the Islamic Exchange Subsidiary (IES) and their respective communities of interest;

[0064] Figure 8 is a high level block diagram of a customized dongle that may be used with the Sharia compliant energy commodity trading and risk hedging system of Figure 7;

[0065] Figure 9 is a high level flow chart that illustrates one example of a sequence of operations that may occur when the Exchange and IES are used to engage in back-to-back order execution to enhance order flow liquidity;

[0066] Figures 10A-10B are the tables that teach the underlying logic employed by the Sharia conversion module, which converts orders placed by Sharia-based customers from a conventional derivatives mode to a Sharia-based mode or vice versa.

DETAILED DESCRIPTION

[0067] Referring generally to Figure 1, trading exchange data flow patterns among various parties using a system for energy market hedging in accordance with the present teachings is illustrated and generally identified at reference character 1. The energy market hedging system 1 is incorporated into a secure web-based Cloud network centered around the energy market hedging system 1 and involving a global energy exchange also referred to as Global Energy e-Bourse or the "Exchange". The energy market hedging system 1 may be extended to the following authorized communities of interest (COI) linked around the world over a secure web-based Cloud network: commercial and speculator customers 2; introducing brokers 3; non-clearing commissioned merchants 4; clearing members of the Exchange 5; non-clearing members of the Exchange 6; clearing house 7; and reporting services 8.

[0068] The commercial and speculator customers 2 are exposed to market price volatility of Middle East (ME) crude oils and refined products varying as to quality (e.g., API gravity; sulfur content), geographic and tanker delivery characteristics. Thus, the customers 2 seek protection against future adverse market price movements by buying and selling standardized futures, options, forwards, swaps and spreads centrally traded over the Exchange, involving the use of proprietary ME-centric benchmarks and indexes.

[0069] Entitled intermediaries engaged between those parties noted directly above and the Exchange include the introducing brokers (IB) 3, non-clearing

commissioned merchants (NCCM) 4 and clearing members of the Exchange 4 that are also commissioned merchants (CMCM). However, it should be noted that although those entitled intermediaries may be engaged in commercial relationships with certain Exchange customers noted above, they are not involved as intermediaries in the chain of Exchange communications, as described more fully below. The non-clearing members of the Exchange (NCMEs) 5 may conduct proprietary trading for their own account as well as for their managed clients' accounts.

[0070] Clearinghouses 7 and reporting services 8 may be contracted by the Exchange to clear, settle and report all executed trades while ensuring that credit risks are managed via required "marks-to-market" and the maintenance of customer margin deposits, as well as (where applicable) the guaranteed deposits of CMs.

[0071] In order to acquire and maintain authorized status, COI must employ Exchange-specified contracts, benchmarks and indexes, as well as Exchange-developed hardware, software applications and processes related thereto, all supplied to COI for use over the secure web-based Cloud network so that bids and offers will be authenticated, posted and ultimately matched, executed and confirmed as trades to be cleared, settled and reported in compliance with policies and rules established by the Exchange.

[0072] Following is a description of those key elements of the web-based Cloud network which are integral to the secure and effective conduct of Exchange business. They are broken into three (3) interdependent aspects noted below, which taken together, create a fluid pool of resources across all servers and data centers enabling COI to access all that is provisioned on an as-needed and authorized basis:

[0073] Front-end: The Exchange's front-end is globally populated by virtual servers acting as the flexible portion of the web-based Cloud network; in all, COI in more than 20 countries are expected to have virtual servers. They may take the form of users' independently employed personal computers, tablets, smart phones or even data interchange terminals tied to other trading systems (as permitted), subject to requirements that they must be (i) compatible with all Exchange-provided software

applications and (ii) interconnected with an Exchange-supplied “dongle” described below. Alternatively, the Exchange can supply COI with its proprietary data interchange terminals containing the requisite software applications and dongle. Either way, front-end virtual servers *inter alia* perform the following functions: (a) receive all notifications from the Exchange re: the user’s authorized status, as well as all software applications and updates provided by the Exchange; (b) confirm all relationships with entitled intermediaries, including the terms and conditions associated with commissions & fees (C&F), margin guarantees, etc.; (c) receive notifications from the Exchange re: all moneys payable or receivable in connection with open trades, settled trades and entitled intermediaries’ C&F; (d) transmit trade orders to the Exchange in the form of bids and offers, which denote:

- Commodity type (including but not limited to Crude Oil, Unleaded Gasoline, Gasoil/Diesel or Heavy Fuel Oil) or index type (Crude Oil API Gravity Value, Crude Oil Sulfur Content Value, Gasoil Quality Value, Residual/Heavy Fuel Oil Quality Value, Gasoil/Diesel Crack Spread Differential Value, Daily Transit Lease Rate for Tankers, or Daily Warehouse Lease Rate for Tankers)
- Benchmark applied in the case of crude oil derived from one of several composites of oil fields located throughout the ME, computed on a weighted average (WA) basis (including but not limited to MEWA Extra Light, MEWA Light or MEWA Medium)
- Terms and delivery point (if FOB: Arabian/Persian Gulf or Suez); (if CIF: various)
- Type of contract (futures, options, forwards, swaps or spreads), as well as contract expiration and delivery date(s)
- Settlement type: financial (cash equivalent) or physical delivery (also referred to as Exchange Futures for Physical Delivery or “EFP”, which may include Salam-style transactions)

- Bid or offer price and volume (in terms of number of contracts, each of which is denominated in the number of barrels or gallons or weight of the underlying commodity)

(e) receive confirmations of authorized executed trades from the Exchange; (f) receive
5 notifications from the Exchange's clearinghouse re: required margin levels to be posted
and maintained in connection with open trade positions and "marks-to-market", as well
as notifications concerning clearance and settlement of trades, including details that
depend on how/where they are to be settled (financially versus physical delivery); (g)
receive reports of trade activity conducted at the Exchange (such as prices and volume
10 associated with open bids and offers, as well as executed trades; and open interest and
other historical trade data); and (h) receive notification of all Exchange and
clearinghouse policies and rules, as well as updates concerning all Exchange-specified
futures, options, forwards, swaps, spreads, benchmarks, indexes, position limits and
margin requirements.

15 **[0074]** Dongle: A dongle is a proprietary data storage hardware device
loaded with software needed to *inter alia* provide security and authenticate the user of
the dongle to virtual servers employed by the Exchange's COI. Dongles made according
to Exchange specifications are supplied to COI either as (i) serialized USB thumb drives
or stick devices connectable to independently employed servers, which require a PIN to
20 reboot the server into an Exchange Cloud-enabled operating environment or (ii) an
integral component of the Exchange's proprietary data interchange terminal. Dongles
enable the Exchange to exercise controls over who can access what data at any given
time, where data is stored and who manages the various storage needs and server
networks, be they at the front or host end of the Exchange's web-based Cloud. Dongles
25 facilitate transformational data protection via sophisticated encryption that bit-splits
data from multiple slices (or shares) and adds authentication and fault tolerant
information as it moves through the web-based Cloud network. This *inter alia* allows
COI to share the same infrastructure without fear of other COI or the general
population at-large accessing data that is not intended to be openly available.

[0075] Alternatively or additionally, authorized Exchange software downloads taking place at authenticated server hardware located in the Exchange's Cloud network may be used to facilitate transformational data protection described above.

5 [0076] Host Server: In addition to the front-end and dongle, proprietary storage networks (aka the host server) make up the last aspect of the Exchange's web-based Cloud network. The host server is configured to accomplish the following: notify all virtual front-end servers of their authorized COI status, as well as all Exchange and clearinghouse policies, rules and updates concerning *inter alia* all Exchange-traded
10 futures, options, forwards, swaps, spreads, benchmarks, indexes, position limits and margin requirements; distribute all software applications and updates provided by the Exchange to authorized COI virtual servers; receive all authenticated customer bids/offers, which are posted and matched with the posted offers/bids of other customers, resulting in confirmations of all executed trades, the data of which is also
15 transmitted to applicable trade counterparties and entitled intermediaries, as well as to the Exchange's contracted clearinghouse and reporting service firm(s); facilitate via the Exchange's contracted clearinghouse the posting/maintenance of all required margin levels based on the attendant open trade positions; facilitate via the Exchange's contracted reporting service firm(s) the fulsome and accurate reporting of all trade
20 activity conducted at the Exchange such as posted prices and volumes associated with open bids and offers, as well as executed open trades, open interest, settled trades and all other historical trade data; based on confirmations received from applicable COI and underlying executed trade data, compute all C&F and other charges associated with each open and settled trade, and notify all affected parties of their respective amounts
25 payable or receivable in connection therewith; and provide a platform for account and payment management, alerts and entitlements in connection with the amounts noted directly above.

[0077] The host server is designed to be multi-faceted and scalable to sufficiently accommodate several Exchange offices posted around the world. The host

server network has been designed to accommodate facilities dedicated solely to the Exchange and/or at qualified remote shared Cloud data resource centers independently contracted by the Exchange.

[0078] Accordingly, the present teachings provide a system for energy market hedging extended to authorized commercial and speculating parties that are exposed to market price volatility of ME crude oils and refined products with varying quality and geographic characteristics. The system for energy market hedging includes an all-electronic exchange platform dedicated to the transparent trading of energy derivatives, including but not limited to futures, options, forwards, swaps and spreads, all based on ME-centric benchmarks and indexes for global execution over a secure web-based Cloud network.

[0079] The system for energy market hedging of the present teachings considers the impact of proposed regulatory initiatives and enables the use of energy derivatives, such as forwards, swaps and spreads, to be traded in a manner that comports with a more stringent global regulatory environment.

[0080] In certain applications, it may be desirable to provide a system that permits execution of a derivatives trade electronically at a point somewhere in the Cloud communication chain, rather than at the host server located at the Exchange's headquarters. For example, host servers may be based in a particular country (e.g., the U.S.) to provide strategic and/or economic advantages.

[0081] Referring now to Figure 2, a summary of Middle East-Centric Benchmarks and Complementary Indexes utilized by the system for energy market hedging is presented below. Crude oil benchmarks, each derived from a composite of ME oil fields, which are subject to change from time to time, include the following: 1) ME Weighted Average (MEWA) Extra Light Crude Oil (API gravity of 39.66° and sulfur content of 0.99%); 2) MEWA Light Crude Oil (API gravity of 33.15° and sulfur content of 1.69%); and 3) MEWA Medium Crude Oil (API gravity of 29.75° and sulfur content of 2.49%).

[0082] The system for energy market hedging further utilizes refined product benchmarks including the following: 1) Unleaded Gasoline (500 ppm sulfur), 2) Gasoil/Diesel (500 ppm sulfur) and Gasoil Crack Spread (between 500 ppm Gasoil and MEWA Light Crude Oil), and 3) Residual/Heavy Fuel Oil (35,000 ppm sulfur).

5 **[0083]** The system for energy market hedging further utilizes complementary differential value indexes including but not limited to the following: 1) Crude Oil API Gravity Value Index focused on variability of API gravity prevalent among crudes produced at ME oil fields, based on value associated with 1.00° differential; 2) ME Crude Oil Sulfur Content Value Index focused on variability of sulfur content
10 prevalent among crudes produced at ME oil fields, based on value associated with 0.1% differential; 3) the aforementioned crude oil differential indexes are structured for trade alongside the Exchange's crude oil EFP futures, valuing variances between the selected benchmark and actual crudes delivered; fee discounts apply when said indexes are traded as designed; 4) Gasoil (Diesel) Quality Value Index (attributable to each 500
15 ppm of sulfur content differential); and 5) Residual/Heavy Fuel Oil Quality Value Index (attributable to each 5,000 ppm of sulfur content differential).

[0084] The system for energy market hedging further utilizes Tanker Lease Rate Indexes, which focus on variability of costs and expenses factored in tanker leases -- excluding fuel costs, which can be hedged via use of the Exchange's Residual/Heavy
20 Fuel Oil futures and options: 1) Daily Transit Lease Rate Index tied to tankers (VLCC and Suezmax, respectively) earmarked for hauling ME crude oil to East of Suez destinations; and 2) Daily Warehouse Lease Rate Index tied to tankers (VLCC and Suezmax, respectively) earmarked for warehousing ME crude oil headed to East of Suez (also able to provide Transit and Warehouse Lease Rate Indexes for smaller crude oil and refined
25 product tankers). Futures and options are priced in U.S. Dollars; other terms -- e.g., based on a Global Reserves Basket Index comprised of a variety of commodity and currency asset classes commonly employed commercially in ME and East of Suez markets -- can also be provided.

[0085] The system for energy market hedging, including Salam-style transactions, further utilizes an EFP Qualification Process in which ME-Centric Crude Oil Futures are complemented by API Gravity Value and Sulfur Content Value Indexes. The EFP Qualification Process includes the following steps. Stage 1, ME crude oil meeting
5 criteria noted below qualifies for delivery within the Exchange's assigned settlement period (per terms of respective EFP contract): To use MEWA Extra-Light crude oil benchmark, deliverable ME crude oil must be derived from an "Extra-Light" field or otherwise have API gravity > 36° and sulfur content < 1.4%. To use MEWA Light crude oil benchmark, deliverable ME crude must be derived from a "Light" field or otherwise
10 have API gravity between 33° and 36° and sulfur content between 1.4% and 2.0%. To use MEWA Medium crude oil benchmark, deliverable ME crude must be derived from a "Medium" field or otherwise have API gravity between 30° and 33° and sulfur content between 2.0% and 2.9%. ME crude oil not meeting specific criteria per above may still qualify for settlement under EFP terms but must first be formally assigned an Exchange-
15 authorized benchmark for trading.

[0086] Stage 2 (for fuel commodities meeting Stage 1 qualification): Cumulative API gravity and/or sulfur content differentials – derived by comparing actual (per Exchanged-recognized assay) and specified benchmark levels -- must also be settled at delivery. This involves traders buying and/or selling, and ultimately co-
20 delivering, long or short complementary index-based contracts, the number of which are determined by an order processing module, comprised of an algorithm employing program logic summarized below and illustrated in greater detail at section [0088]:

- a. First, the algorithm identifies the extent of a trader's open long position (i.e., commitment to take physical delivery of exchange-qualified fuel) or open short position (i.e., commitment to physically deliver exchange-qualified fuel) in the operative derivatives contract, each contract being denominated in a
25 standard unit of volume (e.g., 1,000 barrels of crude oil);

the algorithm determines the extent to which the trader must buy or sell complementary Sulfur Content Value Index contracts based on the factors described below:

- 5 i. Long traders with differentials where the benchmark level is greater (i.e., less valuable) than the actual level contained in the fuel to be received must buy complementary Sulfur Content Value Index contracts; conversely, long traders with differentials where the benchmark level is less than the actual level contained in
10 the fuel to be received must sell Sulfur Content Value Index contracts; and
- 15 ii. short traders with differentials where the benchmark level is greater than (i.e., less valuable) than the actual level contained in the fuel to be delivered must sell Sulfur Content Value Index contracts; conversely, net short traders with differentials where the benchmark level is less than the actual level contained in the fuel to be delivered must buy Sulfur Content Value Index contracts.

[0087] For example, assume Party A (ME crude oil producer) holds an open
20 short position of 800 contracts of MEWA Light Crude Oil EFP Futures expiring December 2012 and agrees to deliver 800,000 barrels of ME crude assayed as having API Gravity of 34° and sulfur content of 1.89%. Thus, Party A must also transact with the Exchange in the open market and co-deliver the following at the December 2012 settlement date: 1) 680 contracts (short) of Crude Oil API Gravity Value Index Futures expiring in December
25 2012; computed by multiplying 800 times the difference between the benchmark (33.15°) and the actual ME crude oil delivered (34°), or 680 contracts – in this case, short because the delivered crude is higher quality than the benchmark. 2) 168 contracts (long) of Crude Oil Sulfur Content Value Index Futures expiring in December 2012; computed by multiplying 800 times the difference between the benchmark

(1.68%) and actual ME crude oil delivered (1.89%), or 168 contracts – in this case, long because the delivered crude is of lesser quality than the benchmark. Incomplete delivery of complementary index futures in the manner described above will result in Exchange-imposed cash adjustments, which are a factor of the requisite number of complementary futures called for under the circumstances and any adverse effects of post-expiration market price moves, plus applicable fees levied by the Exchange.

[0088] Referring now to Figure 3, a system 50 for trading fuels according to the present disclosure is shown. The present disclosure uses crude oils only as an example of a fuel or an energy resource. The teachings of the present disclosure may be applicable to other types of fuels or energy resources including but not limited to natural gas, coal, and so on, as well as refined products derived from crude oil. In general, the teachings of the present disclosure may be applicable to any commodity that is produced and shipped globally and that has varying properties.

[0089] The system 50 comprises a plurality of servers 52-1, 52-2, . . . , and 52-N, where N is an integer greater than or equal to 1 (collectively servers 52); a plurality of trading devices 54-1, 54-2, . . . , and 54-N; and Internet 56. The servers 52 constitute an exchange for trading the fuels. The servers 52 may be located in a single location or may be distributed in multiple locations. The servers 52 may be interconnected via the Internet 56. Alternatively or additionally, the servers 52 may be interconnected via local area networks (LANs) and/or wide area networks (WANs). The servers 52 may communicate with a plurality of fuel producers', users' and speculators' facilities via the Internet 56.

[0090] The trading devices 54 may be located all around the world and are used by traders to communicate with the exchange and to trade the fuels over the exchange. The trading devices 54 may communicate with the servers 52 via the Internet 56, a LAN, and/or a WAN.

[0091] Referring now to Figure 4, an example of a computing device 100 is shown. The computing device 100 may be used to implement the servers 52 and the trading devices 54. The computing device 100 may include a personal computer (PC), a

laptop computer (laptop), a mobile computing device, or a mobile internet device (MID). The mobile computing device may include a smartphone, a personal digital assistant (PDA), or a tablet. The computing device 100 may communicate with the Internet 56 via a link 104. The link 104 may be wired or wireless.

5 **[0092]** In Figure 4, only core components relevant to understanding the present disclosure are shown. It is understood that depending on configuration, the computing device 100 may include additional components not shown. For example only, the computing device 100 may comprise a central processing unit (CPU) 110, memory 112, a peripheral control module 114, peripheral devices 116, an input/output
10 (I/O) control module 118, I/O devices 120, and a communication module 130. The CPU 110, memory 112, and other modules of the computing device 100 communicate via a bus 122.

[0093] The CPU 110 runs an operating system (OS) and application programs. The CPU 110 processes data that is transmitted and received by the
15 computing device 100 via the Internet 56. Memory 112 stores data processed by the CPU 110 and by the other modules of the computing device 100.

[0094] The peripheral control module 114 controls the peripheral devices 116 of the computing device 100. The peripheral devices 116 may include one or more hard disk drives (HDDs), compact disc (CD) drives, and/or digital versatile disc (DVD)
20 drives. The peripheral devices 116 store the OS and the application programs executed by the CPU 110.

[0095] The I/O control module 118 controls the I/O devices 120 of the computing device. The I/O devices 120 may include a keypad, a display, and/or a pointing device. The pointing device may include a mouse and/or a touchpad.
25 Additionally or alternatively, the computing device 100 may include a voice recognition system. The user may interact with the computing device 100 using the voice recognition system. For example, the user may input voice commands via the voice recognition system.

[0096] The communication module 130 can communicate with the Internet 56. The communication module 130 can transmit data to Internet 56 and receive data from the Internet 56.

[0097] Referring now to Figure 5, the computing device 100 may include the following additional modules when the computing device implements one of the servers 52. For example, the computing device 100 implementing the servers 52 may include a data collection module 200, a selection module 202, a weight generating module 204, a benchmark generating module 206, an order processing module 208, and an order execution module 210. The modules may be implemented by a combination of the hardware and software executed by the CPU 110 of the computing device 100.

[0098] The data collection module 200 collects data for a plurality of fuels. The communication module 130 may communicate with a plurality of authorized fuel production data facilities via the Internet 56 and provide the data to the data collection module 200. The data may include geographic locations where the fuels are discovered, a rate of extraction of the fuels, and properties of the fuels. The fuels may include crude oils having varying properties. The properties may include specific API gravity and sulfur content of the fuels.

[0099] The selection module 202 selects fuels from the plurality of fuels based on the properties of the fuels to generate sets of fuels. In other words, the selection module 202 groups fuels into sets based on the properties of the fuels. For example, see Figure 2 showing crude oils grouped into three groups based on their respective API gravity and sulfur content.

[0100] The weight generating module 204 generates weights for generating weighted averages. A weight for generating a weighted average for a fuel in a set is based on a rate of extraction of the fuel relative to an aggregate rate of extraction of the fuels in the set. For example, in Figure 2, Qatar Dukhan crude oil is extracted at a rate of 300,000 BPD, which is nearly 10% of the aggregate rate of production of nearly 3 million BPD for a set of crude oils grouped as MEWA Extra Light Crude Oil. Qatar

Dukhan crude oil has an API gravity of 41.1° and sulfur content of 1.22%. Applying the weight of 300,000 divided by 3 million (i.e., 10%) to the API gravity and the sulfur content of Qatar Dukhan crude oil, the weighted API gravity and sulfur content of Qatar Dukhan crude oil becomes nearly 4.00 and 0.12%, respectively.

5 **[0101]** The benchmark generating module 206 generates benchmarks indicating aggregate compositional qualities of the sets of fuels. A benchmark (also called a fuel commodity benchmark) for a set of fuels is generated based on weighted averages of the properties of the fuels in the set of fuels. For example, in Figure 2, the benchmarks for the MEWA Extra Light Crude Oil are a sum of the weighted averages of
10 the properties of the constituent crude oils. That results in a benchmark having API gravity of 39.66° and sulfur content of 0.99%.

[0102] The communication module 130 communicates the benchmarks to traders and receives orders for derivatives contracts for the fuels from the traders to buy or sell derivatives contracts based on the benchmarks. The orders for derivatives
15 contracts include futures and options, as well as forwards, swaps and spreads traded directly between the traders and fuel producers via the Exchange comprising the servers 52 and without using intermediaries in the chain of Exchange communications. The orders may also include tanker derivatives contracts related to transporting and warehousing the fuels described above.

20 **[0103]** The order processing module 208 processes an order for a fuel based on differences between actual properties of the fuel to be delivered under the terms of EFP Futures, including those that pertain to Salam-style transactions, and the aggregate qualities indicated by the operative benchmark for a set of fuels comprising the ordered fuel. See the trading example described above in detail. The order execution module
25 210 executes the trade and provides order execution data to the trader via the communication module 130. Executing an order encompasses orders being authenticated, posted, matched, executed and confirmed, cleared, settled and reported.

[0104] The data collection module 200 periodically updates the data such as BPD for the fuels. The benchmark generating module 206 generates the updated benchmarks based on the updated data. The communication module 130 communicates the updated benchmarks to the traders.

5 **[0105]** Referring now to Figure 6, a flowchart of a method 300 for trading fuels according to the present disclosure is shown. At operation 302, data is collected for a plurality of fuels, where the data include geographic locations where the fuels are discovered, a rate of extraction of the fuels, and properties of the fuels. At operation 304, fuels are selected from the plurality of fuels based on the properties of the fuels
10 to generate sets of fuels. At operation 306, weights are generated for use in generating weighted averages, where a weight for generating a weighted average for a fuel in a set is based on a rate of extraction of the fuel relative to an aggregate rate of extraction of the fuels in the set. At operation 308, benchmarks are generated indicating aggregate compositional qualities of the sets of fuels, where a benchmark for a set of fuels is
15 generated based on weighted averages of the properties of the fuels in the set of fuels.

[0106] At operation 310, the benchmarks are communicated to traders, and orders are received for derivatives contracts for the fuels from the traders to buy or sell derivatives contracts based on the benchmarks. At operation 312, an order is processed for a fuel, where the fuel is based on differences between actual properties
20 of the fuel to be delivered and the aggregate qualities indicated by a benchmark for a set of fuels comprising the ordered fuel. At 312, the orders are executed, taking into account the complementary Crude Oil API Gravity Value and Crude Oil Sulfur Content Value indexes. These indexes are intended to be used in conjunction with EFP (not cash settled) futures contracts, including Salam-style transactions, and provided as execution
25 data to the traders.

[0107] At operation 314, the data is updated periodically, and then updated benchmarks are generated based on the updated data, and then the updated benchmarks are communicated to the traders. In this manner, the method involves operations that execute orders that include futures and options, as well as forwards,

swaps and spreads, including tanker contracts related to transporting and warehousing the fuels. The orders are traded directly between the traders and fuel producers over the Exchange and without using intermediaries in the chain of Exchange communications. In some implementations, the method 300 is implemented by one or
5 more processors that execute software designed to perform the method 300.

[0108] In general, an energy market hedging system according to the present disclosure is summarized below. The energy market hedging system provides potential price protection to authorized producers and users of Middle East (ME) crude oils and refined products while also offering authorized speculators potential profit
10 opportunities from attendant market price volatility. The system comprises globally scattered communities of interest (COI) operating over a web-based Cloud network centered around a Global Energy exchange also referred to hereafter as Global Energy e-Bourse or the “Exchange”, which is the entity in charge of the following functions.

[0109] For example, the functions include specifying futures, options,
15 forwards, swaps, spreads and other derivatives associated with the buying, selling, storing, shipping and delivery of varying grades of ME crude oil and refined products typically exported to customers in countries scattered throughout the world; listing said futures, options, forwards, swaps, spreads and other derivatives that are extended to the following COI: clearing members of the Exchange that maintain capital deposits to
20 guarantee transactions in the event of customer defaults, non-clearing members of the Exchange, commissioned merchants, introducing brokers, trading counterparties in the form of commercials and speculators (aka Exchange customers), clearinghouses and reporting services, all of which are geographically scattered throughout the world.

[0110] Further, the functions include providing a transparent all-electronic
25 data interchange platform able to authorize, transmit, receive, match, confirm, report, clear, settle and otherwise execute buy and sell trade orders for all listed futures, options, forwards, swaps, spreads and other derivatives with the capability of originating said orders virtually anywhere in the world over a secure web-based Cloud network; establishing all Exchange policies and rules and overseeing the compliance

therewith; arranging for all trades to be cleared and settled by qualified clearinghouses; obtaining all requisite licenses and other approvals granted by applicable government regulatory bodies; and implementing all operating and reporting systems and processes conducive to the overall conduct of exchange business.

5 **[0111]** The listed futures, options, forwards, swaps, spreads and other derivatives are directly or indirectly linked to crude oil benchmarks notionally differentiated by their respective weighted average API gravity and sulfur percentage (%) content, each derived from a composite selection of crude oils produced in fields located throughout the ME region of the world, with the selection and related data
10 being subject to change by the Exchange from time to time.

[0112] The all-electronic data interchange platform comprises a front-end, proprietary data storage hardware devices (aka dongles), and proprietary storage networks aka the host server. The front-end is populated by COI with virtual servers acting as the flexible portion of the web-based Cloud network. The proprietary data
15 storage hardware devices (aka dongles) are loaded with software needed to facilitate transformational data protection via encryption that bit-splits data from multiple slices (or shares) and add authentication and fault tolerant information as data moves through the web-based Cloud network, allowing COI to share the same network infrastructure without fear of other COI or the general population at large accessing
20 data that is not intended to be openly available, thereby providing controls over who can access specific data at any given time, where data is stored and who manages various storage needs and server networks. The proprietary storage networks aka the host server are multi-faceted and scalable to sufficiently accommodate several Exchange facilities around the world dedicated solely to the Exchange and/or at
25 qualified remote shared Cloud data resource centers independently contracted by the Exchange.

[0113] The front-end virtual servers can take the form of the following: COI users' independently employed personal computers, tablets, smart phones or even data interchange terminals tied to other trading systems (where permitted) subject to

requirements that they must be compatible with Exchange-provided software applications and interconnected with an Exchange-supplied dongle; or proprietary data interchange terminals made to Exchange specifications and containing the requisite software applications and dongle.

5 **[0114]** The front-end virtual servers are employed to perform the following functions: For example, the functions include receiving all notifications from the Exchange regarding the user's authorized status as well as all software applications and updates; and confirming all relationships with entitled intermediaries, including the terms and conditions associated with commissions and fees ("C&F"), margin
10 guarantees, etc.

[0115] The functions further include transmitting trade orders to the Exchange in the form of bids and offers that *inter alia* denote the following: commodity type (including but not limited to Crude Oil; Unleaded gasoline; Gasoil/Diesel; or Residual/Heavy Fuel Oil) or index type, including but not limited to Crude Oil API Gravity
15 Value, Crude Oil Sulfur Content Value, Gasoil Quality Value, Residual/Heavy Fuel Oil Quality Value, Gasoil Crack Spread Differential, Daily Transit Lease for Tankers (VLCC and Suezmax, respectively), or Daily Warehouse Lease Rate for Tankers (VLCC and Suezmax, respectively).

[0116] The functions further include transmitting benchmark in the case of
20 crude oil derived from one of several composites of oil fields located throughout the ME, computed on a weighted average (WA) basis, which are subject to change from time to time (including but not limited to MEWA Extra Light, MEWA Light or MEWA Medium); terms and delivery point (such as FOB: Arabian/Persian Gulf or Suez; or CIF: various destinations).

25 **[0117]** The functions further include transmitting type of contract or agreement (including but not limited to futures, options, forwards, swaps or spreads), as well pertinent expiration and delivery date(s); type of settlement (financial [cash or equivalent] or physical delivery); and bid or offer price and volume (in terms of number

of contracts, each of which is denominated in the number of applicable barrels or gallons or weight of the underlying commodity).

5 **[0118]** The functions further include transmitting receiving notifications from the Exchange regarding all confirmed and executed trades, moneys payable or receivable in connection with open trades, settled trades and entitled intermediaries' C&F.

10 **[0119]** The dongles are made according to Exchange specifications and supplied to COI either as serialized USB thumb drives or stick devices connectable to independently employed servers, requiring a PIN to reboot each server into an Exchange Cloud-enabled operating environment; or as an integral component of the Exchange's proprietary data interchange terminal.

15 **[0120]** The host server is employed to perform the following functions: For example, the functions includes notifying all virtual front-end servers of their authorized COI status, as well as all Exchange and clearinghouse policies, rules, and updates concerning *inter alia* all Exchange-traded futures, options, forwards, swaps, spreads, benchmarks, indexes, position limits and margin requirements. The functions further include distributing all software applications and updates provided by the Exchange to authorized COI virtual servers; and receiving all authenticated customer bids/offers, which are posted and matched with the posted offers/bids of other customers, resulting in confirmations of all executed trades, the data of which is then transmitted to affected trade parties and entitled intermediaries, as well as to the exchange's contracted clearinghouse(s) and reporting service firm(s).

25 **[0121]** The functions further include facilitating via the Exchange's contracted clearinghouse(s) the posting and maintenance of all required margins levels based on the attendant open trade positions; and facilitating via the Exchange's contracted reporting service(s) the fulsome and accurate reporting of all trade activity conducted at the Exchange such as posted prices and volumes associated with open bids and offers, as well as executed open trades, open interest, settled trades and all other historical data.

[0122] The functions further include, based on confirmations received from applicable COI and underlying executed trade data, computing all C&F and other charges associated with each open and settled trade, and notify all affected parties of their respective amounts payable or receivable in connection therewith; and providing
5 a platform for account and payment managements, alerts and entitlements in connection with the payable or receivable amounts noted directly above.

[0123] The trade margining, marks-to-market, clearing and settlement functions are facilitated by qualified clearinghouses consisting either of an affiliate of the Exchange or independently contracted clearinghouse(s), each being COI in the web-
10 based Cloud network.

[0124] Turning now to Figures 7-10, teachings of various aspects concerning a system and method of the present disclosure for Sharia-based energy market hedging and related method are provided below as follows. It will be understood that the system discussed in connection with Figures 7-10 may be used to augment the
15 capabilities of the energy market hedging system 1 shown in Figure 1.

[0125] Initially, trading deals solely with permitted (halal) commodities, including but not limited to those typically underlying commerce between producers and users of ME/ES crude oil and refined products. The specifications for those commodities are key factors integral to the configuration of the Exchange's
20 benchmarks, complementary indexes and derivatives contracts (e.g., futures, options, forwards, swaps and spreads), each of which is effected by the Exchange's proprietary information technology ("IT") system modules taught more fully in U.S. Patent Application No. 61/513,792, namely: (i) the data collection module; (ii) the selection module; (iii) the weight generating module; (iv) the benchmark generating module; (v)
25 the communication module; and (vi) the order processing module.

[0126] Referring to Figure 7, there is shown a Sharia-based energy market trading and hedging system 400 (hereafter simply the "system" 400) in accordance with one embodiment of the present disclosure. The system 400 may include an Islamic exchange subsidiary ("IES") 402, a Sharia conversion module 404 (both hardware and

software), and a back-to-back order execution module 406 (also both hardware and software). The IES 402 makes use of a suitable cross-liquidity algorithm 402a for the purpose of consolidating bids and offers from the Exchange and the IES in order to enhance IES liquidity. The algorithm 402a is based on several essential elements including but not limited to the following: (i) IES tick volume, which is the number of changes in a Sharia-based ETD's bid and offer price posted by different IES traders within a given time interval; (ii) the IES tick volume price differential between the lowest bid and the highest offer during the same given time interval; (iii) an optimal IES tick volume threshold level established by the IES for a similar time interval; and (iv) an optimal IES tick volume price differential established by the exchange for a similar time interval. Factors pertaining to (i) and (ii) are divided into factors pertaining to (iii) and (iv), thereby arriving at a percentage. If that percentage deviates from a certain level or range established by the IES, it triggers back-to-back execution(s) as will be described herein. Islamic based financial institutions, such as an Islamic bank 408, have previously authorized access to the IES 402 as do previously approved, Sharia-based (i.e., Sharia compliant or preapproved) traders 410. The system 400 is in communication with a wide area network, for example the Internet, by which the Exchange 412 and the IES 402 can be accessed. Of course, non-Sharia approved traders 414 may also access the Exchange 412.

[0127] Use of the aforementioned IT system modules 202-210 described in connection with Figure 5, and in particular the order processing module 208, may be instrumental to the system 400 of the present disclosure in a plurality of ways. The first is the novel manner in dealing with the impact of typical commercial trade-offs between (i) actual properties of the fuel to be delivered under the terms of an operative derivatives contract and (ii) aggregate qualities indicated by an operative fuel commodity benchmark referenced in said contract.

[0128] The order processing module 208 is designed to employ the effects of one or more of the Exchange's 412 proprietary complementary indexes, which results in financial adjustments being made to adequately compensate for *inter alia* API

gravity and/or sulfur content differentials between physically deliverable and benchmark grades of fuel. This innovative teaching provides substantive means to assuage Sharia-based concerns with regard to issues of (i) traders' intent to either deliver or take delivery and hold (as the case may be) and (ii) double coincidence, which
5 in each case may be overcome by the Exchange's unique ability to match Exchange-For-Physical ("EFP") buyers with EFP sellers having practically, rather than absolute, opposite hedging interests, including but not limited to those engaged in Salam-style transactions.

[0129] Trading of the Exchange's 412 derivatives contracts may be executed
10 by the IES 402 which acts as a subsidiary exchange to serve as a Sharia-based energy trading platform focused on orders placed by parties qualified by Sharia ruling bodies. Such qualified parties may include *inter alia* (i) commercial producers and users of ME/ES crude and refined products; (ii) Islamic banks, brokers or other intermediaries that typically engage with customers who legitimately purchase and sell ME/ES crude or
15 refined products in the normal course; and (iii) Islamic investment companies, funds or vehicles that are permitted to own and hold ME/ES crude or refined products.

[0130] In some cases, it may be advantageous for the Exchange 412 and the IES 402 to function as back-to-back order executors, a structure that is designed to broaden the net in matching Sharia-based buyers and sellers at the IES 402 with
20 compatibly offsetting orders coincidentally posted by other (not Sharia-based) customers at the Exchange 412, thereby enhancing market liquidity at each exchange. The back-to-back order execution module 406 operates co-operatively with the Sharia conversion module 404 to consolidate both exchanges' bids and offers for ultimate execution at the IES 402 pursuant to the cross-liquidity algorithm 402a that factors the
25 relative order flow of each exchange 402 and 412. This is discussed further in the following paragraphs.

[0131] Once the IES 402 is officially notified that a party qualifies for Sharia-based trading, that party is eligible to become an IES community of interest ("COI") registrant. Such registration entails extension of the system's 400 proprietary

capabilities on a restricted/controlled basis via the following embodiments: (i) the front-end, which is globally populated by virtual servers belonging to its registrants, thereby acting as the flexible portion of a web-based (Cloud) network that is capable of integrating *inter alia* existing personal computers, tablets, smart phones, and order entry terminals (including those that are proprietary and others tied to rival platforms); and (ii) dongles, which are operable in either a hardware or downloadable software format and integral to all transformational data protection and management functions, thereby authenticating and otherwise providing security, as well as ongoing exchange access controls, to each registrant's virtual server(s) connected within the COI.

10 **[0132]** With brief reference to Figure 8, a dongle 500 is shown for use with the system 400. The dongle 500 may be interfaced with a computing device (e.g., laptop, desktop, etc.) that is being used by an individual or institution to access the IES 502. The dongle 500 may include a customer position limits enforcement module 502 and a high frequency trade order stuffing block module 504 that are both in
15 communication with a suitable processor 506. The processor 506 may communicate with its host device (i.e., laptop, desktop, tablet, etc.) via a suitable interface circuit 508, such as a USB interface or even a Bluetooth® wireless connectivity interface. The dongle 500 enables the Exchange 412 and the IES 402 (as the case may be) to control “who” can access “what” at any given point. This helps to ensure that only Sharia
20 compliant trades are executed over the IES 402. This feature can be further customized to regulate IES traders that are financial investors or even speculators (if their use may ever be sanctioned by Islamic scholars). Such customization may involve imposing enforceable position limits for each IES trader (via the enforcement module 502) as part of measures designed to establish and maintain market functionality and liquidity
25 within the bounds of what may be deemed by Sharia scholars as reasonably constructive (and thus allowable). Customization may also involve instilling HFT order stuffing blockades, which are implemented via the blocking module 504 that *inter alia* measure and restrict the number and size of orders placed by, withdrawn by, placed again in a repetitive fashion by, and ultimately executed for, the same IES trader within

ultimately executed for, the same IES trader within a certain period of time, all of which may designed to take place as part of an intentional trading pattern deemed by the IES 402 to be disruptive and/or unfair to other IES traders, not to mention censurable by Islamic scholars.

5 **[0133]** It will be appreciated, then, that a central feature of the system 400 involves the Sharia conversion module 404. The scope of the Sharia conversion module 404 is multi-faceted. For one, it effectuates the registration of IES COI members upon official notice from recognized Islamic scholar(s), referred to hereafter as "RIS". The Sharia conversion module 404 also operates to convert orders placed by Sharia-based
10 customers from a conventional derivatives mode to a Sharia-based mode or vice versa, depending on the circumstances. Still further, the Sharia conversion module 404 triggers the use of the back-to-back order execution module 406, which involves engaging both the Exchange 412 and IES 402 in cases where the effects of their respective order flows can be consolidated in order to enhance IES 402 liquidity without delegitimizing any of
15 its Sharia-based transactions.

[0134] As noted above, the Sharia conversion module 404 may convert orders placed by Sharia-based customers from a conventional derivatives mode to a Sharia-based mode or vice versa. Figures 10A-10B are the tables that teach the underlying logic associated with that conversion process.

20 **[0135]** Referring now to Figure 9, a flow chart 600 is shown setting forth one example of a sequence of operations that may be carried out by the system 400. At operation 602, upon official affirmation from the RIS, a Sharia-approved trader becomes an IES 402 registrant. At operation 604 the Exchange 412 may issue the dongle 500 via the IES 402 to the Sharia-approved trader. The Sharia-approved trader may be comprised
25 of either the Islamic Bank 408 or a Sharia-approved trader 410 (i.e., an individual or entity). As such, the Islamic bank 408 or Sharia-approved trader 410 may represent any one of a commercial entity, an investor entity or a speculator entity. At operation 606 the dongle 500 is assigned an IES authorization code which grants the IES registrant access to all reported data concerning bids, offers and executed trades posted by the

posted by the Exchange 412 and the IES 402, respectively (with data connected with the former providing valuable price discovery information supplementing the latter).

5 **[0136]** The dongle 500 may also be employed to curtail speculators by establishing and maintaining customer position limits and instilling HFT order stuffing blockades, as described herein.

10 **[0137]** The back-to-back execution module 406 (Figure 7) operates co-operatively with the Sharia conversion module 404 in cases where it is beneficial to consolidate the bids and offers of both exchanges 412 and 402 for the purpose of enhancing the liquidity of IES 402 order flow. Such a process factors the prevailing relative order flow of each exchange and, if necessary, triggers a back-to back order execution. When a back-to-back order execution is triggered the Exchange 412 or the IES 402 becomes a counterparty to its primary customer trades, and then simultaneously enters into an offsetting Sharia-compliant trade with the other/affiliated exchange (IES 402 or the Exchange 412, as the case may be).

15 **[0138]** At operation 608 the Sharia-approved trader 410 may employ the IES 402 to engage with an Islamic Bank 408 to finance its purchase of the attendant energy commodity. At operation 610, the energy commodity may first be purchased by the Islamic bank using the IES 402. At operation 612 the energy commodity may be sold and delivered to the Islamic bank 408 using the IES 402. At operation 613 the Islamic Bank 408 may sell and deliver the purchased energy commodity to the Sharia-approved trader 410. The sale and delivery at operation 614 is made as part of an Islamic finance arrangement, typically taking the form of a Murabaha or Musawama, whereby the parties use the IES 402 to settle on the purchase price to be paid for the energy commodity, as well as mutually agreeable deferred payment and profit sharing terms.

25 **[0139]** Depending on the terms of the underlying Islamic finance arrangement mentioned above, at operation 616 the Sharia-approved trader 410 may ultimately be required to liquidate or sell its energy commodity position by a future date. This action may be specified as part of the aforementioned deferred payment schedule terms agreed to with the Islamic Bank 408. At operation 618, the liquidation

example requires an intermediary agent, for example the Islamic Bank 408. The Islamic bank 408 acts as the intermediary agent to introduce the trade to the IES 402 in exchange for a commission.

5 **[0140]** During the period when the Sharia-approved trader 410 holds the energy commodity, prior to repaying the Islamic Bank 408 in full, both parties may be exposed to potentially unfavorable movements in the market price of the commodity. This may prompt the parties to hedge the potential market price risk, which may be achieved by the Sharia-approved trader 410 selling an EFP futures contract, including those pertaining to Salam-style transactions, over the IES 402.

10 **[0141]** In some cases, in addition to or in lieu of an EFP futures contract such as that noted above, the Islamic Bank 408 and the Sharia-approved trader 410 may mutually agree that a hedge should occur via IES-executed wa'ad agreements. In such an instance, the parties would hold equal and offsetting option positions having maturity-matched put and call combinations intended to preserve the type of equitable risk
15 sharing that is consistent with Sharia principles.

[0142] With further reference to the spreadsheet of Figures 10A-10B, it will be appreciated that the following notes are applicable.

[0143] Note 1

[0144] Customers 410 engaging in Musawama (trading where Buyers bid and
20 Sellers offer before settling on the contract price without knowing the commodity's actual cost) may do so in the spot market either at the Exchange 412 or at the IES 402.

[0145] The IES 402 should be used to execute Musawama trades when the Islamic bank 408 is engaged to finance the underlying commodity's purchase, similar to cases involving Murabaha.

25 **[0146]** Any Customer 410 not engaging an Islamic bank, and who instead elects to trade at the Exchange 412, is subject to the same Exchange rules as any other (non Sharia-based) trader.

[0147] Note 2

[0148] It will also be appreciated that customers 410 buying commodities per Sharia-based Murabaha (Islamic financing) should do so at IES 402 in a process that engages both the customer 410 and the Islamic bank 408. In cases of IES-executed Murabaha, both the customer 410 and the Islamic bank 408 agree to the market price paid for the underlying commodity, as well as the deferred payment method being used to cover the commodity's cost plus a mutually agreed profit for the Islamic bank.

[0149] If both Murabaha parties agree to hedge the underlying commodity's prospective price movement risk via futures contracts, such hedging transactions may also be executed at the IES 402.

[0150] Musawama traders 410 financed by an Islamic bank 408 are generally subject to the same rules as those for Murabaha. In the case of either Sharia-based type (Murabaha or Musawama), the IES 402 may trigger a back-to-back order execution process with the Exchange 412 in an effort to enhance market liquidity by broadening the net of order flow.

[0151] Note 3

[0152] In cases involving Sharia-based Murabaha or Musawama, the customer 410 and the Islamic bank 408 may want to hedge the contingency risks implied in any outstanding futures contracts. If so, the parties may enter into a bilateral (or reciprocal) Sharia-based wa'ad where the customer 410 and the Islamic bank 408 hold equal and opposite wa'ad positions with the same strike prices. Notwithstanding the above, the customer 410 and the Islamic bank 408 are still obliged to honor all terms of their Sharia-based asset-backed contract irrespective of any periodic changes in the underlying asset's market value.

[0153] All sequencings of periodic and maturity-matched wa'ad put and call combinations (referred to as a reciprocal zero-cost structure) are intended to preserve the type of equitable risk sharing that is consistent with Sharia principles applicable to entrepreneurial investment.

[0154] Note 4

[0155] It will also be appreciated that all transactional payments and settlements occurring under IES-executed contracts in the spot and futures markets, as well as (where applicable) with any related wa'ad agreements, should involve the use of qualified IES escrow accounts. The form, nature and amounts of such accounts are also
5 subject to the RIS sanctioning process.

[0156] As used herein, the term "module" may refer to, be part of, or include an Application Specific Integrated Circuit (ASIC); an electronic circuit; a combinational logic circuit; a field programmable gate array (FPGA); a processor (shared, dedicated, or group) that executes code; other suitable hardware components
10 that provide the described functionality; or a combination of some or all of the above, such as in a system-on-chip. The term module may include memory (shared, dedicated, or group) that stores code executed by the processor.

[0157] The term "code," as used above, may include software, firmware, and/or microcode, and may refer to programs, routines, functions, classes, and/or
15 objects. The term shared, as used above, means that some or all code from multiple modules may be executed using a single (shared) processor. In addition, some or all code from multiple modules may be stored by a single (shared) memory. The term group, as used above, means that some or all code from a single module may be executed using a group of processors. In addition, some or all code from a single
20 module may be stored using a group of memories.

[0158] In some implementations, the systems and methods disclosed herein can be implemented on any computing devices such networked together, where the computing devices include servers, desktop computers, and handheld computing devices such as tablets and smartphones. In these implementations, the modules
25 described herein can be implemented on these devices using a combination of software and hardware that provide the desired functionalities. Due to connectivity and interactions between the modules and the computing devices, integrating the modules with the computing devices creates specialized computing devices that are specifically suitable for the systems and methods disclosed herein.

[0159] While specific examples have been described in the specification and illustrated in the drawings, it will be understood by those skilled in the art that various changes may be made and equivalence may be substituted for elements thereof without departing from the scope of the present teachings as defined in the claims.

- 5 Furthermore, many modifications may be made to adapt a particular situation or material to the present teachings without departing from the essential scope thereof. Therefore, it may be intended that the present teachings not be limited to the particular examples illustrated by the drawings and described in the specification as the best mode of presently contemplated for carrying out the present teachings.

10

CLAIMS

What is claimed is:

1. A computerized exchange-traded derivatives based hedging system to match, execute and settle buy and sell orders placed over an exchange-controlled network by authenticated counterparties desiring to manage energy price volatility risks by trading fuels with quality and logistics properties falling within parameters unique to benchmark-specific fuel sets formulated by the exchange to process ETD settlements by physical delivery when counterparties have practically, rather than absolute, opposite hedging interests, the system comprising:

at least one processor configured to run a plurality of non-transitory, machine executable instructions;

at least one memory in communication with the processor, the memory configured to store the non-transitory, machine executable instructions which when running on the processor are configured to:

collect data for a plurality of fuels, wherein the data include geographic locations where the fuels are discovered, a rate of extraction of the fuels, and properties of the fuels;

select fuels from the plurality of fuels based on the properties of the fuels to generate sets of fuels comprising fuel commodity benchmarks;

generate weights for generating weighted averages, wherein a weight for generating a weighted average for a fuel in a set is based on a rate of extraction of the fuel relative to an aggregate rate of extraction of the fuels in the set;

generate the fuel commodity benchmarks indicating aggregate qualities of the sets of fuels, wherein a fuel commodity benchmark for a set of fuels is generated based on weighted averages of the properties of the fuels in the set of fuels;

communicate the fuel commodity benchmarks to traders and receive orders for derivatives contracts from the traders to buy or sell derivatives contracts based on the fuel commodity benchmarks; and

wherein the order for derivatives contracts based on differences between actual properties of the fuel to be physically delivered under terms of an operative derivatives contract and aggregate qualities indicated by the fuel commodity benchmark is processed by an algorithm stored in the memory and running on the processor, the algorithm employed to compute a requisite number of long or short complementary index-based derivatives contracts taking into consideration attendant fuel quality variability including at least one of specific API gravity and sulfur content, with said contracts being executable for co-delivery on the settlement date of the operative derivatives contract;

wherein the orders include the Sharia-based exchange-traded derivatives ("ETD") for execution by the exchange; wherein the exchange has an Islamic Exchange Subsidiary ("IES") for handling the Islamic financed commodity transactions; and

wherein a Sharia-based conversion module triggers the use of a back-to-back order execution module, which involves engaging both the exchange and the IES in cases where the effects of their respective order flows can be consolidated.

2. The system of claim 1 wherein:

the collected data is updated data periodically;

the fuel commodity benchmarks are based on the updated data; and

the updated fuel commodity benchmarks are communicated to the traders.

3. The system of claim 1 wherein:

the fuels include crude oils; and

the properties include specific API gravity and/or sulfur content of the fuels.

4. The system of claim 1 wherein the orders for the derivatives contracts encompass futures, options, forwards, swaps and spreads traded between the traders and fuel producers via an Exchange providing the system and either with or without using intermediaries in a chain of communications over the exchange-controlled network, wherein the traders include fuel users and market speculators.

5. The system of claim 1 wherein the orders for derivatives contracts include derivatives contracts related to costs of transporting and warehousing the fuels stored onboard tankers.

6. The system of claim 1 wherein the fuels include crude oils, refined products derived from crude oil, natural gas, and coal.

7. A server comprising the system of claim 1 wherein the server communicates with a computing device used by one of the traders via a network including the Internet.

8. A method comprising:

using a processor running non-transitory machine executable instructions, and in communication with a memory, to:

collect data for a plurality of fuels, wherein the data include geographic locations where the fuels are discovered, a rate of extraction of the fuels, and properties of the fuels;

select fuels from the plurality of fuels based on the properties of the fuels to generate sets of fuels comprising fuel commodity benchmarks;

generate and store in the memory weights for generating weighted averages, wherein a weight for generating a weighted average for a fuel in a set is based on a rate of extraction of the fuel relative to an aggregate rate of extraction of the fuels in the set;

generate and store in the memory the fuel commodity benchmarks indicating aggregate qualities of the sets of fuels, wherein a benchmark for a set of fuels is generated based on weighted averages of the properties of the fuels in the set of fuels;

communicate the benchmarks to traders and receiving orders for derivatives contracts for the fuels from the traders based on the benchmarks; and

process an order for derivatives contracts based on differences between actual properties of the fuel to be delivered under the terms of an operative derivatives contract and the aggregate qualities indicated by an operative fuel commodity benchmark, and which determines the number of long or short complementary index-based derivatives that a specific trader may be required to obtain for co-delivery on the operative derivatives contract's settlement date.

9. The method of claim 8 further comprising:
updating the data periodically;
generating updated fuel commodity benchmarks based on the updated data;
and
communicating the updated fuel commodity benchmarks to the traders.

10. The method of claim 8 wherein:
the fuels include crude oils; and
the properties include specific API gravity and/or sulfur content of the fuels.

11. The method of claim 8 wherein the orders for derivatives contracts encompass futures, options, forwards, swaps and spreads, the method further comprising trading the orders between the traders and fuel producers via an exchange and either with or without using intermediaries, wherein the traders include fuel users and market speculators.

12. The method of claim 8 wherein the orders include derivatives contracts related to costs of transporting and warehousing the fuels stored onboard tankers.

13. The method of claim 8 wherein the fuels include crude oils, refined products derived from crude oil, natural gas, and coal.

14. The system of claim 1, wherein:
the fuels include landlocked crude oils; and
the properties include specific API gravity, sulfur content and the respective geographic locations of the landlocked crude oil's production, delivery and customer destination points.

15. The system of claim 1, wherein the orders include derivatives contracts related to the costs of transporting and warehousing the landlocked crude oils using intermodal permutations, including but not limited to storage terminal, pipeline, boat, rail and/or truck solutions.

16. The method of claim 8 wherein:
the fuels include landlocked crude oils; and
the properties include specific API gravity, sulfur content and the respective geographic locations of the landlocked crude oil's production, delivery and customer destination points.

17. The method of claim 8, wherein the orders include derivatives contracts related to the costs of transporting and warehousing the landlocked crude oils using intermodal permutations including but not limited to storage terminal, pipeline, boat, rail and/or truck solutions.

18. The system of claim 1, wherein the orders include Sharia-based exchange-traded derivatives ("ETD") for execution by the Exchange's Islamic Exchange Subsidiary ("IES") as part of Islamic- financed energy commodity transactions employing at least one of Murabaha, Musawama or Salam-style transactions, that match the bilateral interests of Exchange-For-Physical ("EFP") buyers with EFP sellers having practically, rather than absolute, opposite hedging interests.

19. The system of claim 18, wherein the IES, the candidates to become IES registrants, the Sharia-based ETD specifications and their attendant Islamic-financed and/or Salam-style energy commodity transaction specifications are sanctioned by recognized Islamic scholars ("RIS").

20. The system of claim 19, wherein upon official notification of RIS-sanctioned status, an IES registrant is provided a customized dongle assigned with an IES authorization code serving to:

restrict and control "who" can access "what" data at any given point, thereby ensuring inter alia that only Sharia-compliant trades get executed;

grant the IES registrant access to all reported data concerning bids, offers and executed trades posted by the Exchange and the IES, respectively; and

curtail investor and speculator interests, when required to maintain RIS-sanctioned status, by imposing Sharia-based ETD position limits and instilling order stuffing blockades.

21. The system of claim 18, wherein a Sharia conversion module ("SCM") is operative with the data collection, selection, weight generating, benchmark generating, communication and order processing modules to convert the Exchange's conventional ETD into Sharia-based ETD fit for execution by the IES in tandem with attendant Salam-style and/or Islamic-financed energy commodity transactions.

22. The system of claim 21, wherein a back-to-back execution module is operative with the SCM to consolidate both exchanges' customer bids and offers for ultimate execution at the IES pursuant to a cross-liquidity algorithm factoring the prevailing relative order flow of each exchange and triggers, when necessary, back-to-back executions whereby:

the Exchange becomes a counterparty to its primary customers' conventional ETD bid or offer;

the Exchange then simultaneously posts an offsetting offer or bid, which upon SCM processing is converted to a Sharia-based offer or bid with the IES; and

the IES executes a Sharia-based ETD trade involving its primary customers, offset by the aforementioned Exchange bid or offer.

23. The system of claim 1, wherein an order for derivatives contracts based on differences between actual properties of the fuel to be physically delivered under the terms of an operative derivatives contract and the aggregate qualities indicated by an operative fuel commodity benchmark is processed by an algorithm employed to compute the requisite number of long or short complementary index-based contracts valuing attendant fuel quality variability including but not limited to API gravity and sulfur content, with said contracts being executable for co-delivery on the operative derivatives contract's settlement date.

24. The system of claim 23, wherein the processor uses the algorithm to compute the requisite number of co-deliverable long or short complementary index-based contracts, in accordance with operations employing program logic summarized below:

first, the algorithm identifies the extent of a traders open long position (i.e., commitment to take physical delivery of exchange-qualified fuel) or short position (i.e., commitment to physically deliver exchange-qualified fuel) in the operative derivatives contract, each contract being denominated in a standard unit of volume (e.g., 1,000 barrels of crude oil);

next, in cases involving crude oil, the algorithm multiplies the trader's identified open long or short derivatives contract position by a factor of 1,000 times the difference between API gravity level specified in the operative fuel commodity benchmark and the actual level contained in the fuel to be physically received or delivered; upon solving that equation the algorithm determines the extent to which

the trader must buy or sell complementary API Gravity Value Index contracts based on the factors described as follows:

long traders with differentials where the benchmark level is greater (i.e., more valuable) than the actual level contained in the fuel to be received must sell API Gravity Value Index contracts; conversely, long traders with differentials where the benchmark level is less than the actual level contained in the fuel to be received must buy API Gravity Value Index contracts; and

short traders with differentials where the benchmark level is greater (i.e., more valuable) than the actual level contained in the fuel to be delivered must buy API Gravity Differential Index contracts; conversely, short traders with differentials where the benchmark level is less than the actual level contained in the fuel to be delivered must sell API Gravity Value Index contracts; and

wherein the algorithm multiplies the trader's identified open long or short derivatives contract by a factor of 1,000 times the difference between the sulfur content level specified in the operative fuel commodity benchmark and the actual level contained in fuel to be physically received or delivered; once that equation is solved, the algorithm determines the extent to which the trader must buy or sell complementary Sulfur Content Value Index contracts based on the factors described as follows:

long traders with differentials where the benchmark level is greater (i.e., less valuable) than the actual level contained in the fuel to be received must buy Sulfur Content Value Index contracts; conversely, long traders with differentials where the benchmark level is less than the actual level contained in the fuel to be received must sell Sulfur Content Value Index contracts; and

short traders with differentials where the benchmark level is greater (i.e., less valuable) than the actual level contained in the fuel to be delivered must sell Sulfur Content Value Index contracts; conversely, short traders with differentials where the benchmark level is less than the actual level contained in the fuel to be delivered must buy Sulfur Content Value Index contracts.