

The AltKuznets Webinar Series:

# Green Hydrogen Regulatory & Biz Opps

PRASAD RAO, PHD  
DIRECTOR

ALTKUZNETS SUSTAINABILITY ADVISORS  
altkuznetsadvisors.com

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<https://t.globallinker.com/pBL5q>

# ALTKUZNETS BIZ STAKES

- **MARKET REGULATORY FIRM**

- Sponsored by Climate, Bullion, Schump-Sector Associations
- Administer DPE-based Social Optimization
- Develop Index of Hydrogen Technology
- Administer Niche GETFs
- Implement NCP Buybacks
- Administer Subsidies & Incentives
- Administer Bullion Hedge PE & Capital Finance
- Administer Climate Bond with PLI & GH2 Credits
- Administer Collateral Gold & Market Operations
- Administer Collateral-sourced AI

- **BIZ CONSULTING FIRM**

- Green Hydrogen Credits, PLI, EV Bundles & Sustainability Certificates
- Administer Derivative-leveraged FLEX CAP
- Community Power & Storage
- IPO Re-ranking

# POST TALK BREAKOUT ROOMS

## 1. REGULATORY OPPORTUNITIES

- i. DPE REGULATORY FIRM
- ii. FLEX CAP

## 2. BIZ OPPORTUNITIES

- i. GHCs & PLI
- ii. COMMUNITY FUEL CELL & BESS CHARGING
- iii. FREIGHT N FLY

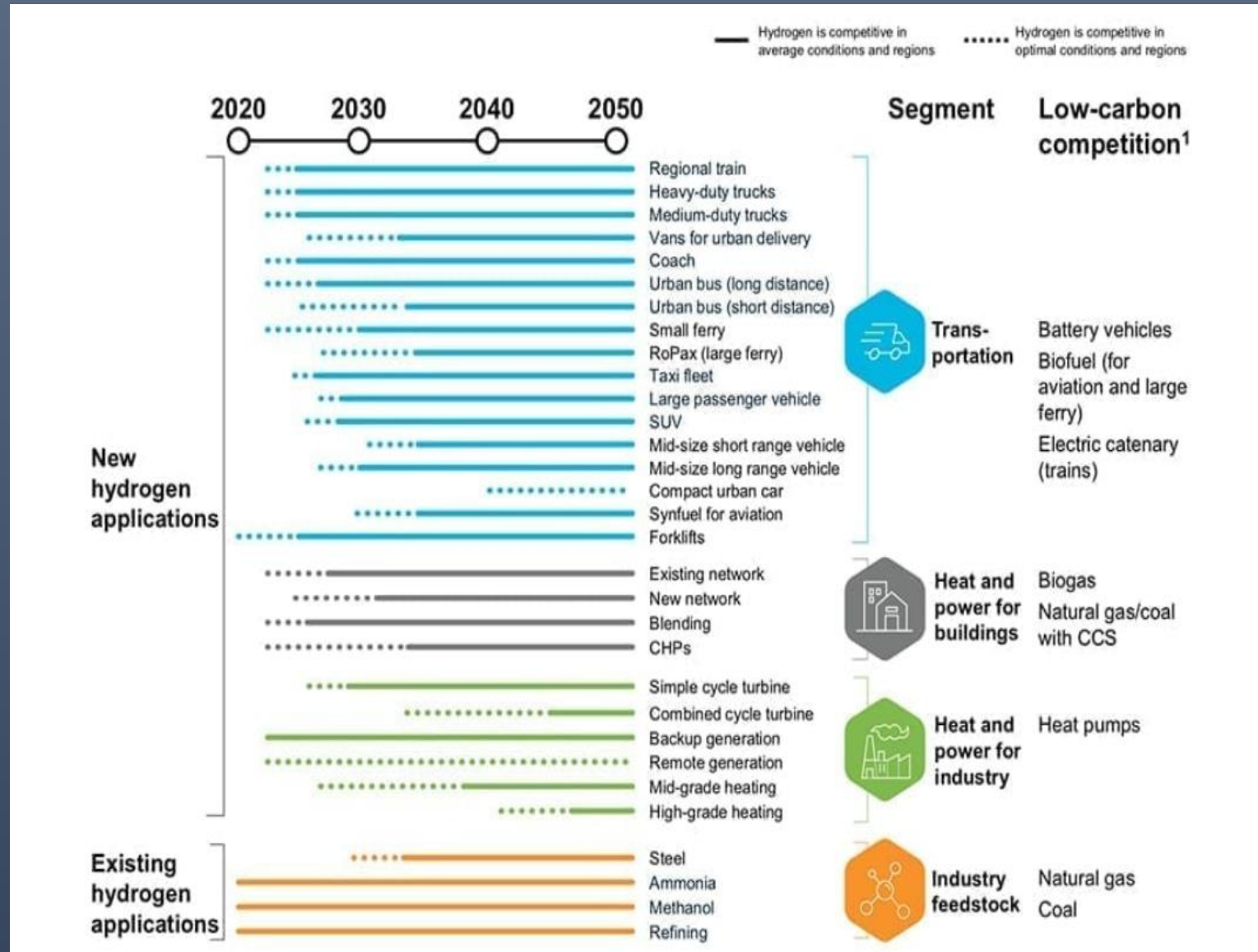
# Energy Landscape

- Dominating agenda of Climate Change led to Politically-facilitated, Technology-forcing Policy Initiatives in Solar, ISA / Wind / Green Hydrogen / Bio-fuels, GBA / Nuclear on the decline
- CO2 Emissions levelling off with slowing Oil Consumption, but Reserves adding up.
- The Per-Capita LQ Revolution in Africa, & SE Asia likely to add Transportation Emissions, thus negating Emissions de-growth elsewhere, and continuing the inexorable rise in CO2 Concentrations
- CO2 Space created by Developed nations leveraged in Resource-rich Developing nations (Net Zero).
- Slow-changing Social Preferences & Durables Life; Social ties to OpCy Biz is a major Climate concern.
- Price-based Profit Strategy dovetailed to Private Ren. Capital turns Climate concerns secondary
- Blending & Inter-Renewables Competition retains existing Infra & Durables, favors continuation of FF domination
- Improving Solar Efficiencies imply Patent Pressure beyond low Prices & enlarging Market Share
- Continuing Technological Advances in Green Hydrogen Consuming Sectors (Trucking, Aviation)
- Entry of GBA likely to divert No-Risk Capital, worsen Competition and Prices in Road Transport
- Refineries & OMCs significant consumers of Green Hydrogen. Issue over Emissions Standard

# Green Hydrogen – Salient Features

- Technology
  - Electrolysis
  - Catalysts & Dopants
  - Liquefaction
  - Hydrogen-using Durables
  - Blending (with LNG Turbine)
- Competition
  - Renewables (Solar/Wind/BioFuels)
  - Net Zero
- Prices
  - Blue, Grey, Black
  - With Subsidies & PLIs
  - Certificates
- Social
  - Society bought in to OpCy, slo to change
- Technology Niches
  - Production Pipelines Storage Tanks,
  - Liquefaction Shipping & Ferry/Haulage
  - Aviation Freight Trucks
  - Turbines Feedstock
  - Heating Power Generation
- Policies
  - Net Zero
  - Competition within Renewables
  - PLI
  - Public-Private Capital
- Schump
  - Employment Sensitivity
  - Political Affiliations
  - Plastic & other Solid Waste Issue

# What does PowerMag say about New Hydrogen Technologies?



# Outline of Presentation

- ❖ **Intent:** Present a Dynamic Programming-based Social Optimization, and Create a Regulatory Context & elaborate on Regulatory issues, and touch upon Biz Opportunities
- ❖ **Section 1: Context for Regulatory Intervention**
  - Net Zero & Socio-political Externality
  - Capital Market Externalities
  - Inertia in Fuel-consuming Durables
  - The Dual Threat of Blue Hydrogen
  - Implications of BESS Energy Storage for Green Hydrogen
- ❖ **Section 2: Socio-Political Optimization of Green Hydrogen Market**
  - Benevolent Monopoly-Monopsony in Green Hydrogen (rationalized by Market Externalities)
  - Variable Private-Public Cost of Capital
- ❖ **Section 3: Regulatory Opportunities**
  - The NCP BuyBacks
  - The Hydrogen Sustainability Differential
  - The Schump IPO Externality
  - Regulatory Opportunities
- ❖ **Section : Biz Opps**
  - Leveraging Green Hydrogen as PQ- & AQI-incrementing Sustainability Certificates (with Precinct Realty Payoff)
  - Schump Replacement Freight Vehicles pareto with Freight n Fly (Dual Use Opps)
  - Community Hydrogen Fuel Cell Production, Storage, Charging and AC Subsidy Power
  - Derivative-leveraged FLEX CAP

# Regulatory Context

## ❖ Context

- Contemporary Development
  - Hydrogen Promoting entities focus on Technology & Politics, not Market
  - Global Bio-Ethanol Alliance in the follow of the ISA – Diversion of Incremental Public Resources
  - Tendency to prefer a Price Strategy; However, tech gains in Solar & EV Space imply Volume, not Price strategy for GH2
  - EU Carbon Permits trade between 80-100 Euros per tonne
  - Hydrogen Prices \$3-7.5 per Kg ....intent to expand scale until \$1 per Kg
- Energy Market Trends
  - Increasing number of Renewable Options, yet...
  - Price-led Profits & PE determination
  - The Financialization of Carbon Permits & Credits in to Tokens & Blockchains have marginalized Environment
  - Fossil Fuel Reserves rising even as emissions are levelling off & 420 ppm [CO2] - Policy Issue
- Net Zero & Socio-political Externality
  - Net Zero has wide Political acceptance; Politics bound to Net Zero & SDG Agenda
  - Net Zero & Blending obtain Control over Renewables
  - Lax Green Hydrogen Emissions Standard is incentivizing of FF Growth & higher Carbon Plateau
  - Net Zero does not promise Carbon Plateau; Green Hydrogen Bond would
  - Net Zero compatible with Price Strategy; Green Hydrogen for Env Sustainability with Volume Strategy



# Regulatory Context...contd

- Capital Market Externalities
  - Capital Market PEs continue to factor in Reserves & Growth in FF Consumption
  - Capital Market PEs do not adequately reflect implications of Climate Sustainability Goals
- Inertia in Fuel-consuming Durables
  - Scrappage of 'Old' durables associated with significant Solid Waste issues
  - Scrappage of recent durables pose Plastic Waste issues
  - Durables Schump requires a Cap on (Sub-Sectoral) Fossil fuel Durable Miles & Fuel Consumed; not Market Shares in expanding economy
  - Necessary to adopt Hydrogen-Consuming Durables on expedited basis (with Capital Subsidy)

# Regulatory Context ...contd

- The Dual Threat of Blue Hydrogen
  - Blue Hydrogen has Scale & Scope Economies to the Zero Marginal Cost asymptote
  - Shares LNG Infrastructure
  - Competes in both Hydrogen & Electricity/EV markets
  - Could potentially exploit Green Hydrogen Emission Standard when co-located
  - Hence, take on Blue Hydrogen in Environmental & Regulatory Markets
- Implications of Energy Storage for Green Hydrogen
  - BESS is both a Demand Shifter & a Price Dampener
  - BESS permits Hydrogen to compete in high Amperage Charging niche
  - Widespread adoption of BESS dampens open market Power prices, hence advisable to instead adopt a 'Merge to Large Volume' Strategy as prices peak out
  - Private entities do not have incentive to prefer Volume Strategy; Regulators would
- The Climate Sustainable Volume vs Net Zero Price Strategy
  - Blue Hydrogen & BESS together imply Volume Strategy would dominate Price Strategy

# Regulatory & Market Threats to Green Hydrogen

- Blue Hydrogen beneficiary of Price Strategy
- Lack of Market Appreciation for Sustainability (Low Or No PE Differential) & Schump Potential
- Blue H<sub>2</sub>-convenient Green H<sub>2</sub> Emissions Standard & Co-location → Net Zero Dovetail Risk
- Fossil Fuel Exploitation of Renewable (Blending & Emissions) Credits
- Inadequate Safety Thresholds & Policy
- Liquefaction & Safety Costs limit wide adoption of Green Hydrogen.
- Blend Cap/Blend Mix – the Intra-Renewable Competition (compete on your side of the Lunch table)
- Global BioFuel Alliance
  - Diversion of PublicRenewable Capital
  - Loss of Surface Transport Market Share

# The NHM What-if Cause Bond

- Significant Sovereign Commitment to Green H2 as a Climate Sustainable Fuel
- Sovereign Capital implies an Enviro-Socio-Politico-Economic objectives best exemplified by a Multi-attribute Cause Bond
- Such Multi-attribute Cause Bond could be nurtured by NHM Bond Administrator that centralizes & aggregates Production & Sales to maximize Cause
- Cause Bond operates around a Gold-collateralized NAV expressed as a FFF
- Comprised of flexibly-formulated Technology, Production, Political, Social and Financial variables that obtain integrated, yet flexible expansion of Green H2 Sector
- NAV biased toward Hydrogen Volumes Sales; Bond also permits of monetization/support to Hydrogen Consumers; hence Bond obtains an egalitarian outcome characterized by ubiquitous use of Green Hydrogen.
- Quadratic Price Expectations are correct to Volume bias.

# Financial Structure of Alt-NHM Cause Bond

- ❖ NHM What-if Cause Bond Collateralized by 'Technology FV Gold'
- ❖ FV Gold converts to PV Gold against an exogenous (Climate Bond-set) Cost of Capital
- ❖ Hydrogen PV Gold further leveraged to issue Niche-GETF Capital
- ❖ Cost of Capital-based PV Monetization of FV Capital obtains Cause Capital for Hydrogen Infra, Hydrogen-using Durables & Production Subsidy

# The NHM Whole FV Finance Model

## Cryptic Finance Lines

- **Collateral:** Mint Local-ZS-RoW Auerbach
- **Cause Public:** Sovereign Mint Cause; **Cause Private:** Political Coterie
- **OC:** Energy-consuming (NCP-rich) listed firms
- **OE ZS:** Carbon Energy Supplier Constituency
- **AO:** Prospective Hydrogen-Producers, and other Renewables – Solar, Wind and Hydro,
- **OB:** CC-Recycler/Cogen/MSW/Waste-to-Energy Power.
- The Hydrogen Cause is handled by NHM with the Impenured in the Social Mirror
- 3G3D Future issued Precinct Impenured ZS HouseBond
- Hydrogen Moon FVPV issued CC Economy vs Green/Auerbach IPO
- Bond ETV FVPV Monetize → Green Hydrogen Schump PV → Frontline OC Equities ; Schump Mirror → RE Blend, Alternate Fuels
- NHM Schump Moon First Dollop → R&D; Follow Schump One-time Dollop → Laggard OC Equities; Perennial Volatility → NCP-rich OC Entities
- Volatility PV Bakey issued as Trade Social; Co-location, Safety & Merger lines; Start → Hybrid CC Next Economy
- Tangentially, NHM & NHM-ranked programs could receive Galactic Remedial CBDC lines

## NHM: A Benevolent Monopsony-Monopoly Administrator

- Multi-Attribute NAV tracks P, Q<sup>2</sup>, Value-added, Employment, Competition, Capacity Addition, Vol. of GETFs monetized and State of Hydrogen Technology

$$NHMNAV (P_{CBU}^{NHM} Q_{CBU}^{NHM})$$

$$= \alpha + \begin{matrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \\ \beta_6 \\ \beta_7 \end{matrix} \begin{matrix} BIZVOLSQ \\ VAGDP \\ SUMEMPL \\ HHI \\ HYDCAP \\ CUMGETF \\ HTECH \end{matrix} + \frac{1}{2} \begin{matrix} BIZVOLSQ \\ VAGDP \\ SUMEMPL \\ HHI \\ HYDCAP \\ CUMGETF \\ HTECH \end{matrix} \begin{matrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} & \beta_{15} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} & \beta_{25} \\ \beta_{31} & \beta_{32} & \beta_{33} & \beta_{34} & \beta_{35} \\ \beta_{41} & \beta_{42} & \beta_{43} & \beta_{44} & \beta_{45} \\ \beta_{51} & \beta_{52} & \beta_{53} & \beta_{54} & \beta_{55} \\ \beta_{61} & \beta_{62} & \beta_{63} & \beta_{64} & \beta_{65} \\ \beta_{71} & \beta_{72} & \beta_{73} & \beta_{74} & \beta_{75} \end{matrix} \begin{matrix} BIZVOLSQ \\ VAGDP \\ SUMEMPL \\ HHI \\ HYDCAP \\ CUMGETF \\ HTECH \end{matrix}$$

$$BIZVOLSQ_t = [w_0 P_{HYD,t}^2 V_{HYD,t} + 2w_1 E[P_{HYD,T/2}] I[V_{HYD,T/2}] + w_2 E[P_{HYD,T}] I[V_{HYD,T}^2]]$$

$$I[P_{Hyd,S,t}^{NHM}] = \beta_{0t} + \beta_{1t}(T-t) - \beta_{2t}(T-t)^2$$

- Calibration of Coefficients & NAV ETV determined by Pol.Coterie Judges Vs Traders holding 'Pareto Max-Difference Min' Cycle Calibration Cryptos issued by NHM Cause Bond. Judges issued Interim Pay-offs that vary with extent of Group Dovetail. ...
- Bond units amenable to Trading, Issual of POUs, DPS & Hedge PE tuning

# HBJ Dynamic Programming Model of Green Hydrogen

$$\max rJ^{NHM} = NHMNAV - rV^{NHM}(\cdot)$$

$$rV^{NHM} = [CoAGGSBSD + \sum_{Nk} CoGETFCAP_{Nk} GETF_{Nk} + HYDCAP V'_{HYDCAP}] + \lambda [NHMNAV - f(Eq2)]$$

$$P_{Hyd,S,t}^{NHM*} = rV'_{NHMNAV} \rightarrow \rightarrow V_{HYD}^*$$

$$GETF_{Nk,t}^* = rV'_{CoGETFCAP,Nk} - HYDCAP V'_{HYDCAP,CoGETFCAP,Nk}$$

$$HYDSBSD^* = rV'_{CoSBSD} - HYDCAP V'_{HYDCAP,CoSBSD}$$

$$HYDCAP_{Nk}^* = V_{HYDCAP,CoC_{HYDCAP,Nk}}^{-1} [rV'_{CoCHYDCAP,Nk} - HYDCAP]$$

- Simple Dynamic 'Flow' Formulation with Dynamic Costs, V
- Obtains Marginal Cost & Optimal Volume of Green H2 Production
- Obtains optimal GETF issuals
- Obtains optimal Subsidies
- Optimal Capacity Additions
- Various Elasticities & Analytical derivatives



# Bond Monetization & Cost of Capital

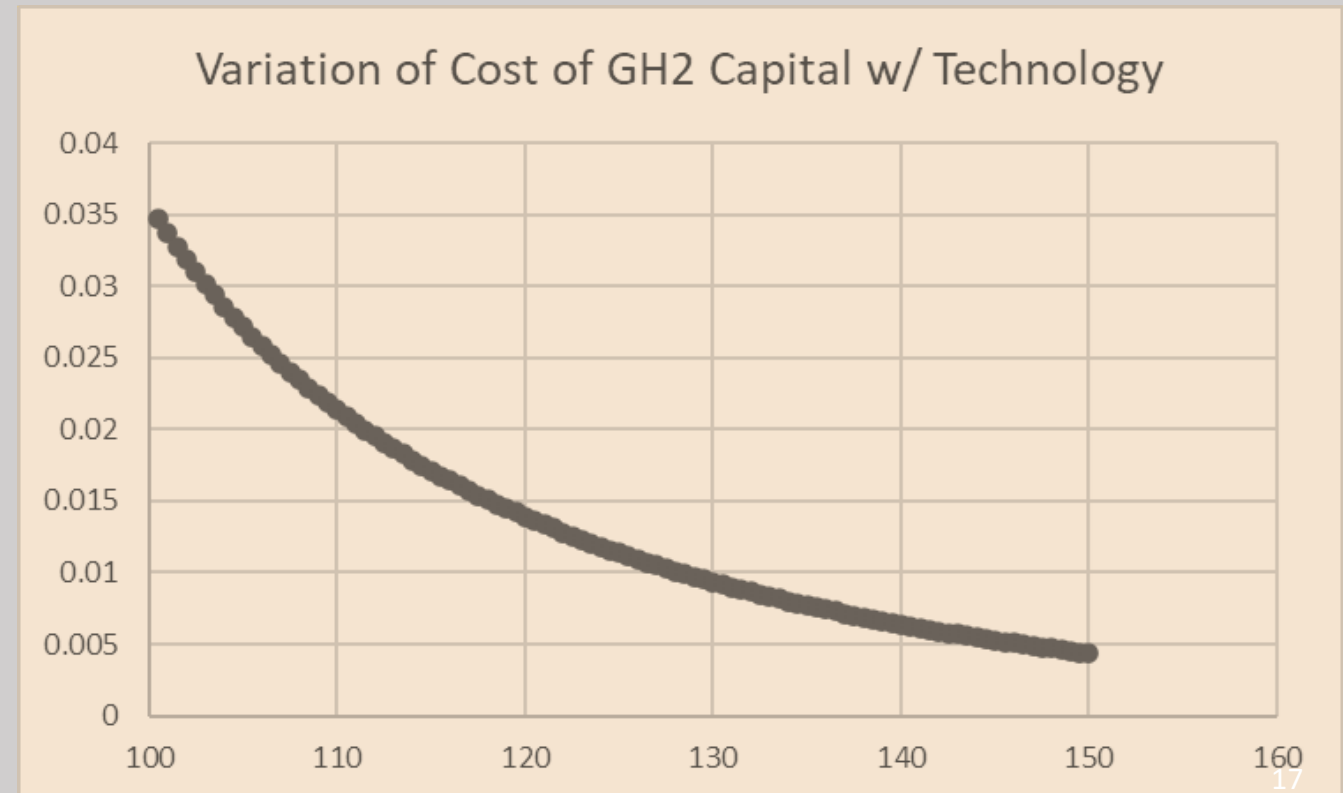
- Cost of Capital-based PV Monetization of Cause FV Capital
- Precincts with low GH2 Emissions, (LNG Blends), high Fossil Fuel Share, and high HTECH values favoured with low Cost of Capital Hydrogen funds.
- Cost of generating Hydrogen Capital
  - increments with Volume LNG accommodated (Blending Load),
  - but falls with advances in Green Hydrogen & allied Tech; Eventual Carbon concentration and State of Global Warming

$$CoC_{HYDCAP,t} = \left[ \frac{\beta_{OE} MAXLNG^{AO}_t}{(\beta_{pub} CCLBLTY_t^{OE})(\beta_{prv} HTECH_{futr,t}^{OC})} \right]^{(1-FFSh_t)} ;$$

$$\beta_{OE}, \beta_{pub}, \beta_{prv} > 0$$

$$CCLBLTY_x = (Exp[CO2]_T - [CO2]_t)(3 - [\Delta CO2_t])$$

'Vertical' Emission Standard could replace MaxLNG



# Modified Cost of *Incremental* Capital (with Cum.GHES)

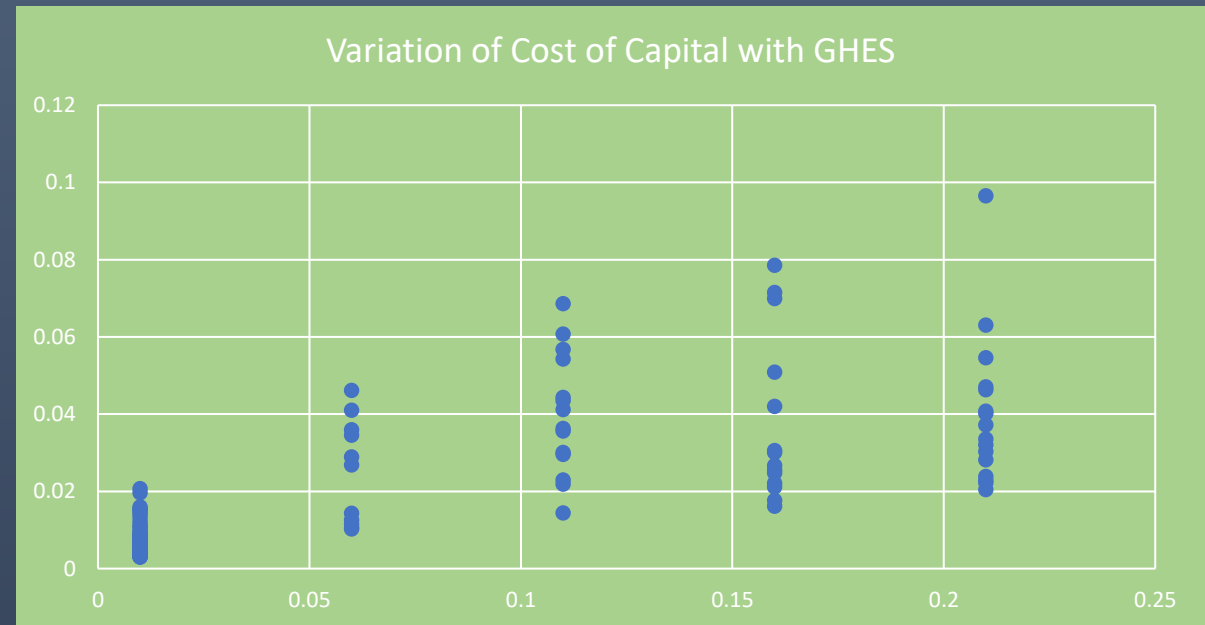
- Replacing MAXLNG with Cumulative Green Hydrogen Emissions Standard, CUMGHES
- CUMGHES represents Emissions Standard over all upstream stages to current use.
- Cost of Incremental Monetizations relate to CUMGHES
- Necessary to link PLI to CUMGHES
- Low cost capital for Liquefaction of Green H2 facilitates early transition to Hydrogen-powered Aviation

$$CoC_{HYDCAP,t} = \left[ \frac{\beta_{OE} CUMGHES^{AO}_t}{[(\beta_{pub} CCLBLTY_t^{OE}) + (\beta_{prv} HTECH_{fntr,t}^{OC})]} \right]^{(1-FFSh_t)}$$

$$\beta_{OE}, \beta_{pub}, \beta_{prv} > 0$$

$$CCLBLTY_{jt} = (E[CO2]_T - [CO2]_t)(5 - \Delta CO2_t)$$

CUMGHES = Cumulative GHES along Production – Transport – Storage – Liquefaction



# RATS PROGRAM FOR SIMULATION OF GHES-DIFFERENTIATED COCHYDCAP

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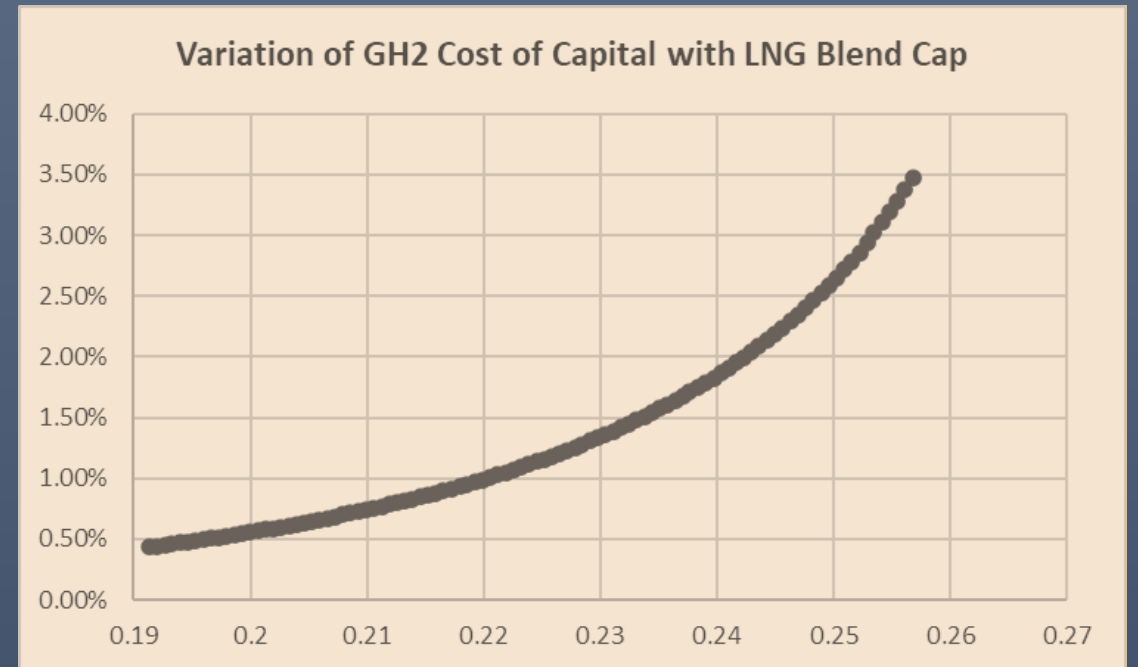
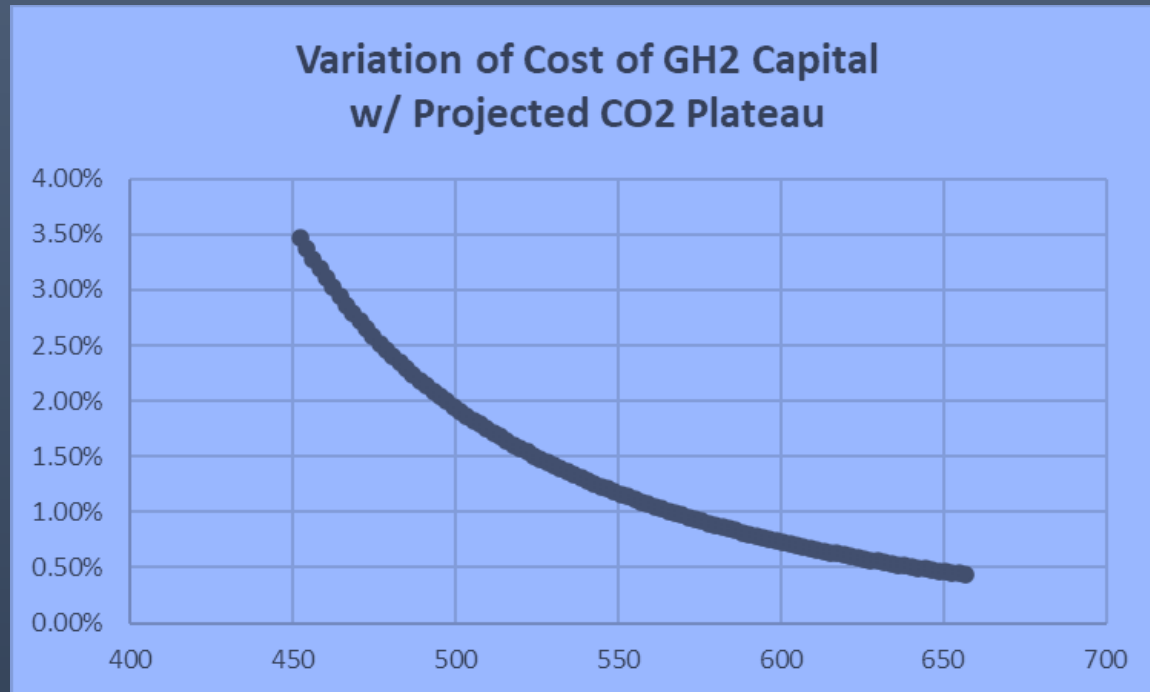
19  calendar(m) 2023:1
20  *
21  allocate 2100:12
22  *
23  NONLIN GAMMA0 GAMMA1 GAMMA2 GAMMA3 GAMMA4 BETA1 BETA2
24  *
25  INPUT GAMMA0 GAMMA1 GAMMA2 GAMMA3 GAMMA4 BETA1 BETA2
26  0.1 1.0 1 0.01 1 0.1 0.1 1 1 1
27  *
28  NONLIN BETA31 BETA41 BETA51 BETA32 BETA42 BETA52 BETA33 BETA43 BETA53
29  *
30  INPUT BETA31 BETA41 BETA51 BETA32 BETA42 BETA52 BETA33 BETA43 BETA53
31  0.1 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
32  *
33  DECLARE REAL EXPTERMCO2
34  *
35  NONLIN ETA1 ETA2 ETA3 ETA4 LAMBDA
36  *
37  INPUT ETA1 ETA2 ETA3 ETA4 LAMBDA
38  1 1 1 0.01 1.1
39  *
40  *NONLIN CUMGHES
41  *
42  *INPUT CUMGHES
43  *0.1
44  *
45  *Comparison of Lifecycle Greenhouse Gas Emissions of Various Electricity Generation Sources
46  *
47  DO TIME = 1, 100, 1
48  *
49  COMPUTE Y = 1 + 0.01*%RANINTEGER(1,10)*TIME
50  *
51  COMPUTE CO2 = 420 + 0.075*TIME + 0.05*%RANINTEGER(1,10)
52  *

```

1	STAGE	CUMGHES	CO2	CO2PLATEAU	FFSH	HYDTECH	CCLBLTY	COCHYDCAP
2	4	0.21000	420.32500	452.05018	0.51356	100.50000	155.95894	0.09658
3	2	0.11000	420.30000	454.10024	0.51230	101.00000	166.15997	0.06865
4	1	0.01000	420.42500	456.15128	0.51096	101.50000	175.62736	0.02072
5	3	0.16000	420.80000	458.20536	0.50950	102.00000	183.87879	0.07859
6	2	0.01000	420.77500	460.25640	0.50823	102.50000	194.08444	0.01961
7	1	0.06000	420.80000	462.30805	0.50695	103.00000	204.04691	0.04616
8	2	0.11000	420.62500	464.35640	0.50576	103.50000	214.97810	0.06072
9	3	0.16000	420.85000	466.41170	0.50437	104.00000	223.97359	0.07149
10	3	0.16000	421.12500	468.46920	0.50295	104.50000	232.73342	0.06998
11	2	0.11000	421.10000	470.52072	0.50169	105.00000	242.94139	0.05678
12	1	0.06000	421.12500	472.57346	0.50040	105.50000	252.90907	0.04102
13	2	0.11000	421.05000	474.62340	0.49916	106.00000	263.35560	0.05431
14	2	0.01000	421.32500	476.68406	0.49775	106.50000	272.13049	0.01595
15	1	0.01000	421.30000	478.73583	0.49648	107.00000	282.33961	0.01557
16	1	0.01000	421.32500	480.78930	0.49519	107.50000	292.31076	0.01520
17	2	0.01000	421.65000	482.85459	0.49375	108.00000	300.86156	0.01485
18	1	0.06000	421.42500	484.89869	0.49259	108.50000	312.01855	0.03598
19	3	0.01000	421.70000	486.96360	0.49117	109.00000	320.81369	0.01417
20	1	0.06000	421.72500	489.01829	0.48988	109.50000	330.79062	0.03453
21	1	0.01000	421.55000	491.06337	0.48869	110.00000	341.70616	0.01353
22	4	0.21000	422.02500	493.14082	0.48717	110.50000	349.57656	0.06305
23	2	0.11000	421.70000	495.17774	0.48606	111.00000	361.19158	0.04435
24	2	0.11000	421.82500	497.23827	0.48472	111.50000	370.70411	0.04352
25	4	0.01000	422.10000	499.30817	0.48330	112.00000	379.52295	0.01238
26	3	0.16000	422.22500	501.37029	0.48195	112.50000	389.04300	0.05092
27	2	0.11000	422.15000	503.42035	0.48071	113.00000	399.49010	0.04115
28	4	0.01000	422.07500	505.47005	0.47948	113.50000	409.93547	0.01159

# Cost of Green Hydrogen Capital

- Cost of GH2 Capital from NHM Bond determines Sector Growth rate and ultimate Sector size
- LNG represents a potent competitor in Energy Markets, hence
- Our model increments Cost of Capital with fractional LNG Blending

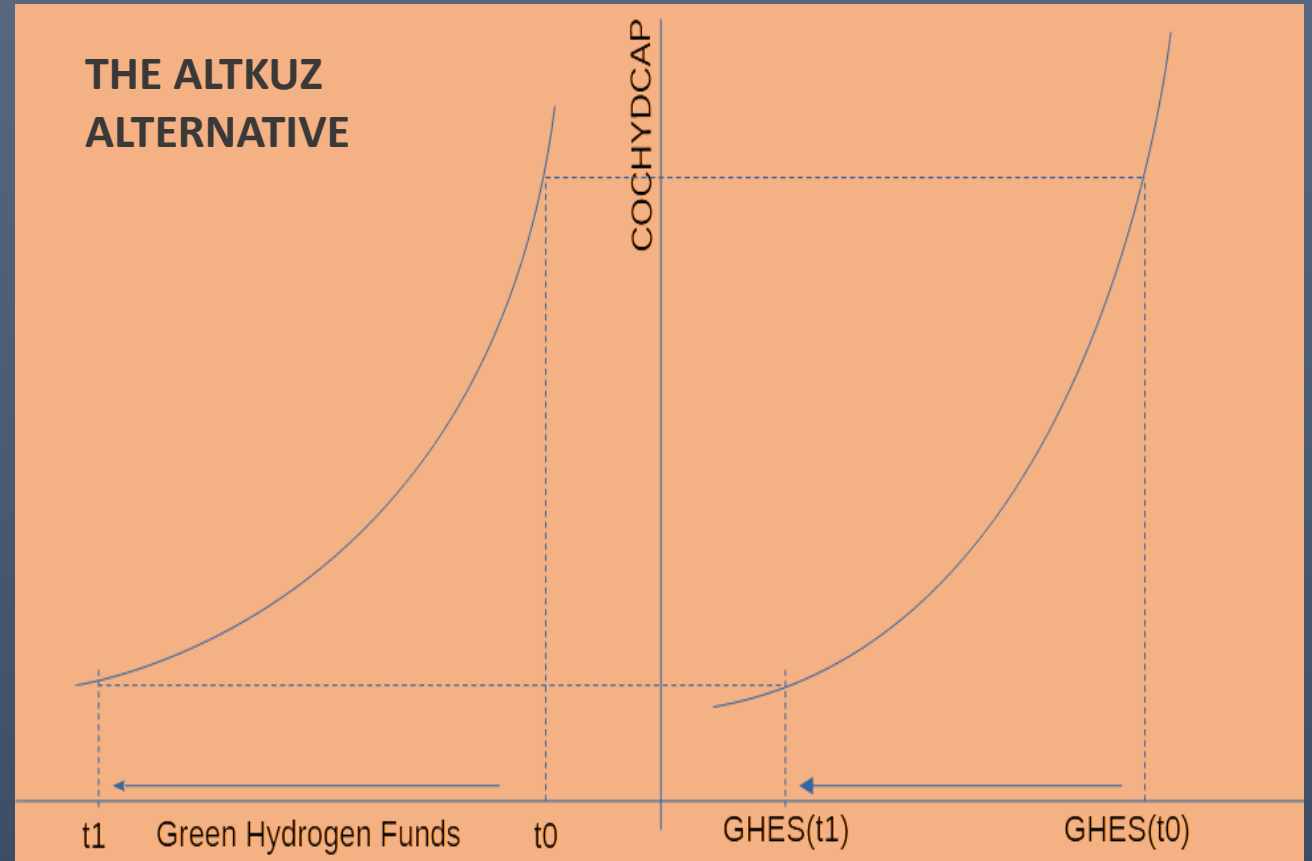
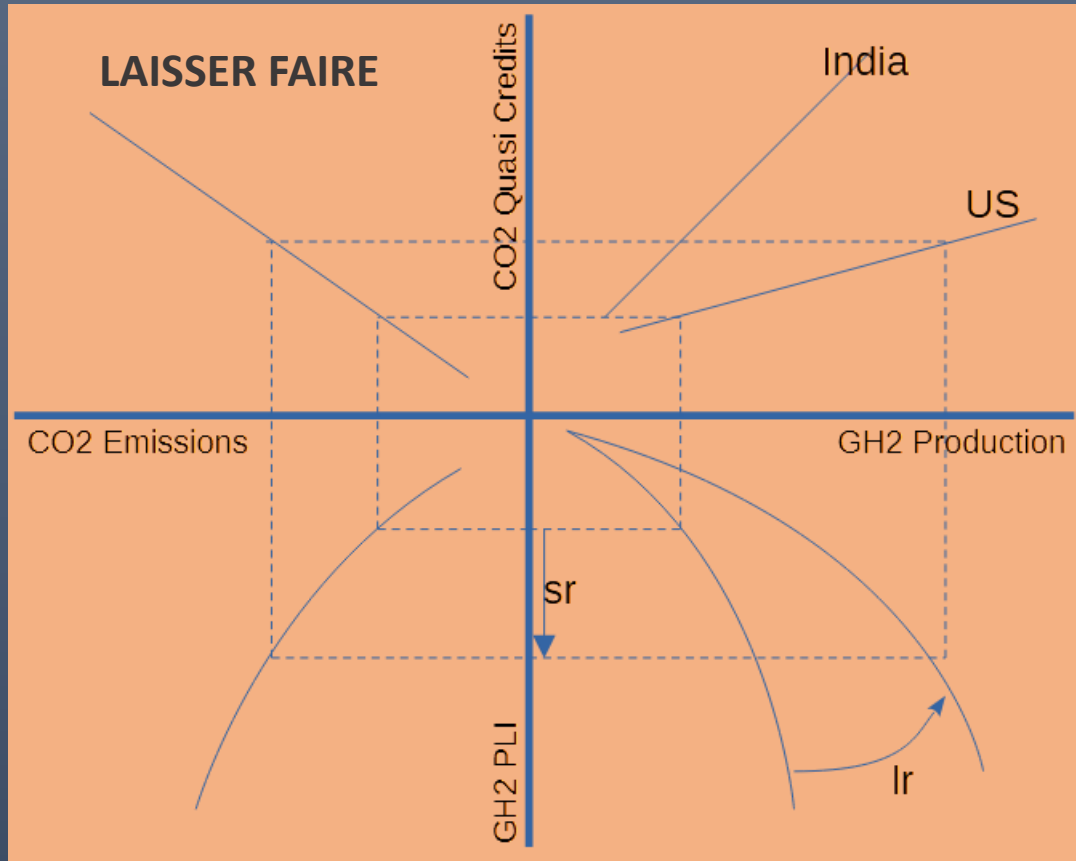


- Cost of Capital anticipates eventual CO2 Plateau
- Cost of Green Hydrogen Capital decrements with rise in eventual CO2 concentration
- Thus steep projections of CO2 Plateau from current unsustainable growth would be responded with near zero-priced Capital

# The Green Hydrogen Emission Coefficient, GHES

- GHES, denominated in Kgs Co2 per Kg GH2, adds to CO2 Space with Additionality Clause. No Differentiation between Blue and Green Hydrogen
- Denomination is convenient to Net Zero, and raises CO2 Plateau in the Limit
- It could (instead) be computed as a Sector-vertically Updated Measure
- GHES could endogenously determine COCHYDCAP, IPO Waiting Time, PLI & GH2 GETF *'Groan Load'*
- Such calibration of Hydrogen Parameters to GHES guides the Green H2 Sector toward minimal associated CO2 emissions & minimal exploitation under Net Zero
- Minimizing GHES differentiates Green Hydrogen from Net Zero Strategies and facilitates earlier achievement of Climate Sustainability

# The GHES – Laissez Faire & AltKuz Alternative



- GH2 PLI, meant to aid in expediting Climate Sustainability, instead induces incremental [CO2]
- GHES-calibrated COHYDCAP induces entire Green Hydrogen Sector to shrink GHES toward Climate Sustainability

# Mint-NHM Bullion Operations

- Regular ETVNAV Updates (POUs) permits revision of Technological & Climate Change Expectations
- Vega Technology FV Gold transform at COCHYDCAP to Green H2 PV Gold. Consequently,
  - Gold Prices fall
  - CoC of Hydrogen Niche GETFs falls
- Volume of Technology FV Gold transformed to Hydrogen PV Gold increments with decrements to COCHYDCAP ( & increments in reaction to Bond underperformance)
- Strategy anticipates eventual exacerbation of Env. degradation with early Hydrogen monetizations and early adoption of new Technology
- Cause Failure, exploited as Bullion Volatility & Bullion Hedge Monetizes, and propagate thru Bond as diverging incentives to conforming and failing firms

# NHM Niche GETF – Supply & Demand

$$Sh_{QPVTONS,t} = \frac{QPVTONS_{HYDCAP,t}^{NHM}}{QPVTONS_{HYDCAP,t}^{NHM} + QFVTONS_{HYDCAP,t}^{NHM}}$$

$$= \mu_0 t \left[ \frac{\Delta NHMNAV_t}{COC_{HYDCAP,t}} \right]^{\mu_1}$$

$$\Delta NHMNAV_t = |NHMNAV^* - NHMNAV_t|$$

$$NHMNAV^* = NHMNAV_t \quad |$$

$$HTECH_{fric,t} = HTECH_{fric,t}^*$$

$$HHI_t = HHI_t^*$$

$$\mu_1 > 0, \mu_2 > 0;$$

$$Sh_{QPVTONS,t} \sim 0; \quad Sh_{QPVTONS,t} \sim 1$$

2<sup>nd</sup> Tier →→→→→

NHM PV Gold further leveraged to Niche GETFs with GETFLVRG

← ← ← ← ← 1<sup>st</sup> Tier

NHM Technology FV Gold stepped down to PV Gold with Application of Cost of Hydrogen Capital, COCHYDCAP

Monetization Friction issued Bullion/Climate Hedge

$$GETFLVRG_{Nk,t} = \frac{P_{GETF,Nk,t} \cdot Q_{GETF,Nk,t}}{P_{g,t} QPVTONS_{GETF,Nk,t}}$$

$$V_{GETF,Nk,t} = GETFLVRG_{Nk,t} P_g QPVTONS_{GETF,Nk,t}$$

$$GETFLVRG_{Nk,t} = q(NSC_{Nk,j,T}, NETVP_{NGETF_{Nk,t}}^{NHM\_Pub}, NPP_{NGETF_{Nk,t}}^{NHM\_Priv})$$

$$= \gamma_0 NSC_{Nk,T}^{\gamma_1} NETVP_{NGETF_{Nk,t}}^{NHM}^{\gamma_2} NPP_{NGETF_{Nk,t}}^{NHM}^{\gamma_3}$$

$$\gamma_0, \gamma_1, \gamma_2, \gamma_3 > 0$$



# Developing Indices of Technology

Let  $HTECH_{f_{nr},T} = f(E_{IT}[S_{Ni}], E_{IT}[S_{Nj}], E_{IT}[S_{Nk}]); f'_{SVr} > 0, f''_{SVr} < 0 \dots\dots\dots (a)$

Given

$$S_{N,r,t} = A_N(\pi_{N,t}, R_{N,t}, Eff_{Nr,t}, MC_{Nr,t}, EMP_{Nr,t}, FSE_{Nr,t}, RQ_{Nr,t}) \quad r:[i, j, k.. \dots\dots (b)$$

we may write

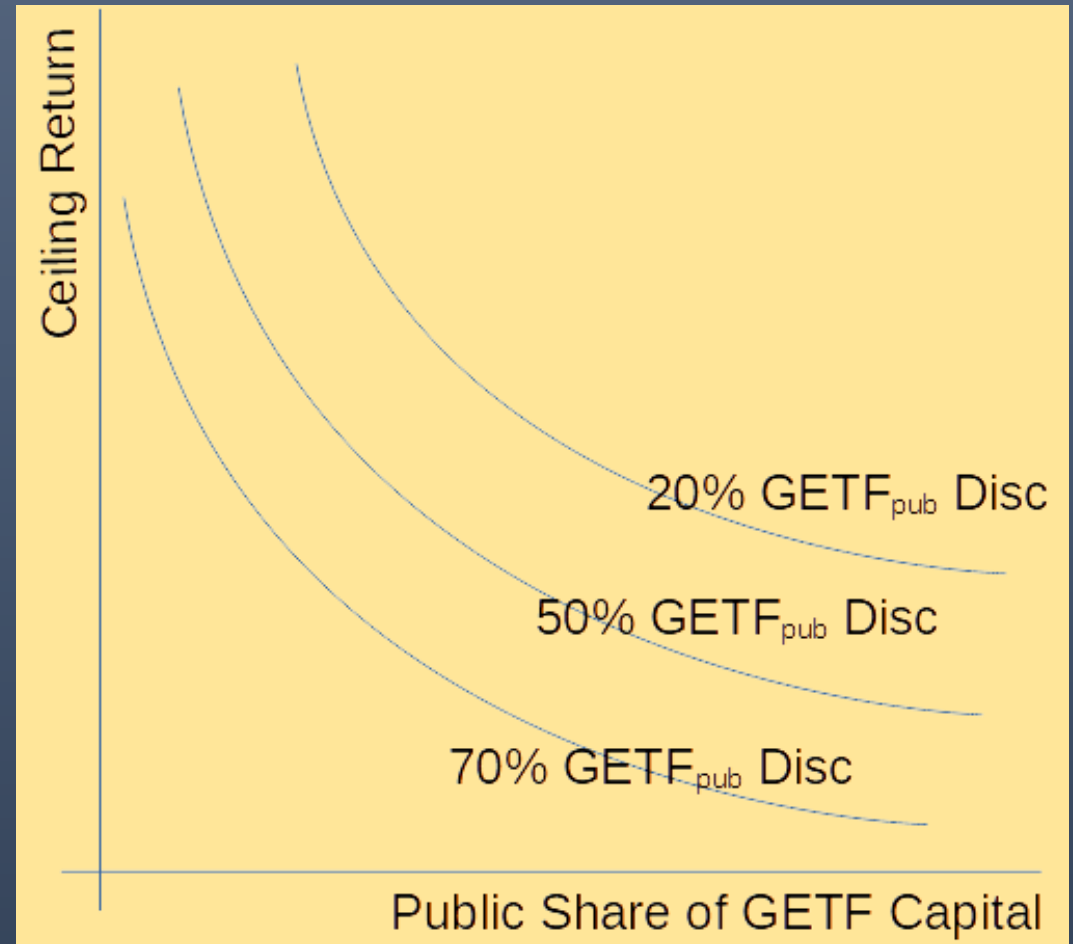
$$HTECH_{f_{nr}} = \text{MaxMin}(E_{IT}[A_{NT}]) \\ = \text{DIV}[\text{MaxMin}_{(r=i,j,k)}(E_{IT}[\pi_{Nr,t}, R_{Nr,T}, EFF_{Nr,T}, MC_{Nr,T}, FSE_{Nr,T}, RQ_{Nr,T}])] \dots\dots\dots (c)$$

Profits, Rev, Eff, MC, Recycling Quotient, Fuel Sub. Elasticity. GHES

- HTECH a composite of polar limits of Technological & Economic attributes as projected in to Terminal time
- HTECH is a Index computed from an envelope of Upper & Lower Technology & Economic parameters
- It accommodates Public & Private attributes of Technology
- HTECH constitutes frontier of Technological achievements and cost reductions
- HTECH indicative of potential size of Market Niche & magnitude of Returns
- Crucial Determinant of CoCHYDCAP & GETF Capital<sup>25</sup>

# Ceiling on Returns

- Return Ceiling justified due Bond Capital Participation & PLI Issuance from Climate Bond
- Return Ceiling consistent with attenuated Risk due Sov. Bond sponsorship & lower Expectations associated with Public Capital



$$\dot{INV}_t = \frac{dINV}{dt} = \phi_0 \Delta SILI_1^{\beta_1} PHYD_{SR,t}^{\beta_2} PINV_{HYD,t}^{\beta_3}$$

$$\beta_1, \beta_2 > 0, \beta_3 < 0$$

$$PINV_{HYD,t} = \mu_0 \dot{INV}_t^{\mu_1} PRVCAP_t^{\mu_2} INVCAP_t^{\mu_3}$$

$$\mu_1, \mu_2, \mu_3 > 0$$

$$\dot{INV}^* = \frac{1}{[1 - \mu_1 \phi_3]} \left[ \mu_0 \phi_0 \Delta SILI^{\beta_1} PHYD_{SR,t}^{\beta_2} PRVCAP_t^{\mu_2} INVCAP_t^{\mu_3} \right]$$

$$PINV_{HYD,t}^* = \mu_0 \left[ \frac{1}{[1 - \mu_1 \phi_3]} \phi_0 \Delta SILI^{\beta_1} PHYD_{SR,t}^{\beta_2} \right]^{\mu_1} PRVCAP_t^{\mu_2} INVCAP_t^{\mu_3}$$

$$INV_t^* = g(\overset{-ve}{\%IMPRTD}, \overset{-ve}{SILI}_T, \overset{-ve}{P}_{Hyd,t}^{mkt}, \overset{-ve}{P}_{Hyd,t}^{fill}, \overset{-ve}{P}_{Hyd,t}^{drwl})$$

$$INV_t^* = \left[ \frac{\%IMPRTD}{SILI_t} \right]^{(1-\rho_1)} \left[ \frac{P_{Hyd,t}^{mkt} - P_{Hyd,50\%ile,t}^{drwl}}{P_{Hyd,5\%ile,t}^{fill} - P_{Hyd,95\%ile,t}^{fill}} \right]^{(1-\rho_1)}$$

$$1 > \rho_1 > 0$$

$$INV_t = \lambda \cdot INV_t^* + (1 - \lambda) \cdot INV_{t-1}$$

Falling Inventories ( $\Delta INV < 0$ )

$$PINV_{HYD,prdcr,t}^{fill} = -\mu_0 \Delta INV_t^{\mu_1} PRVCAP_{prdcr,t}^{\mu_2} \%INVFLLD_{t-1}^{\mu_3}$$

$$\Delta INV_t = INV_{t1} - INV_{t0}$$

$$\mu_{1f}, \mu_{2f} > 0; \mu_{3f} < 0$$

Rising Inventories ( $\Delta INV > 0$ )

$$PINV_{HYD,prdcr,t}^{fill} = \mu_0 (K - \Delta INV_t^{\mu_1}) PRVCAP_{prdcr,t}^{\mu_2} \%INVFLLD_{t-1}^{\mu_3}$$

$$\Delta INV_t > 0, \mu_{1r}, \mu_{2r}$$

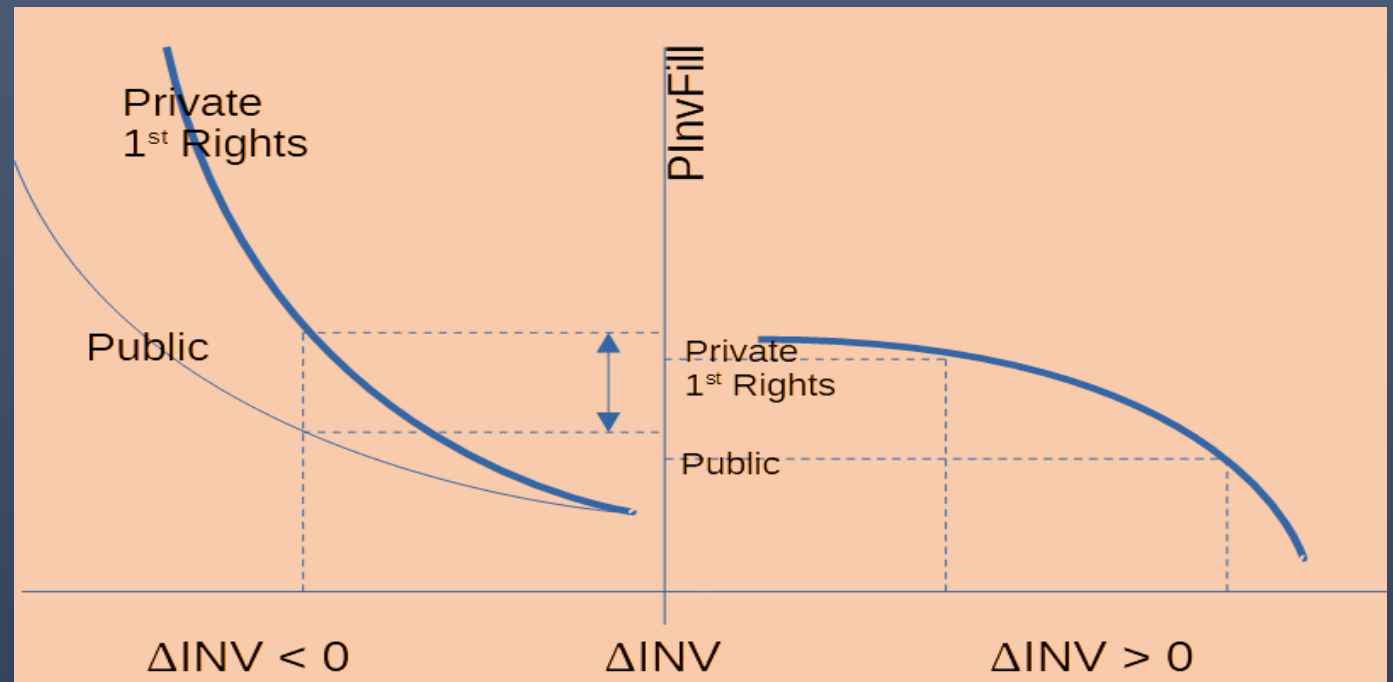
$$\mu_{3f} < \mu_{3r} < 0;$$

$$K > \Delta INV_t^{\mu_1}$$

SILI : Static Inventory Life Index (Weeks Supply @ current Consumption)

## Inventory Control

- NHM could consider a Public H2 Inventory across facilities
- Variable Stocking Prices related to Percent Public Capital Participation
- Hydrogen firms receive higher Stocking prices with more Private Capital participation
- Optimal Inventory Function permits Price Alpha, but resolves End User Volume concerns.
- Prices paid by End User Consuming firms determined by
  - NCPs turned in
  - Magnitude of FSE
  - Niche Competitiveness (Niche GETF ETV)



# Dynamic Optimization of a Multi-Attribute LR Hydrogen NAV Function

- Inter-temporal Optimization of Multi-attribute NAV within HBJ formulation
- $V(w, Pe, Pm, K, HTECH)$
- $rV$  is the flow version of Long-term Cost that solves shadow costs associated with quasi-fixed factors
- Optimizes Price & Output (and Financial market operations) for Socio-political maximization of Hydrogen Technology
- Obtains Optimal expressions for Marginal Cost, GETF Issual, Subsidies and Investments in Hydrogen Capacity

$$\max rJ^{NHM} = NHMNAV - rV^{NHM}(\cdot)$$

$$rV^{NHM} = [CoAGGSBSD + \sum_{NR} CoGETFCAP_{NR} GETF_{NR} + HYDCAP V'_{HYDCAP}] + \lambda [NHMNAV - f(Eq 2)]$$

$$P_{Hyd, S, t}^{NHM*} = rV'_{NHMNAV} \rightarrow V'_{HYD}$$

$$GETF'_{NR, t} = rV'_{CoGETFCAP, NR} - HYDCAP V'_{HYDCAP, CoGETFCAP, NR}$$

$$HYDSBSD' = rV'_{CoSBSD} - HYDCAP V'_{HYDCAP, CoSBSD}$$

$$HYDCAP'_{NR} = V'^{-1}_{HYDCAP, CoC_{HYDCAP, NR}} [rV'_{CoHYDCAP, NR} - HYDCAP]$$

where

$$CoHYDCAP_{NR} = \sum_{NR} CoC_{HYDCAP, NR} HYDCAP_{NR}$$

$$GETFSBSD_t = \sum_{NR} \left[ \left( 1 - \frac{P_{NGETF, NR, t}^{NHM}}{P_{NGETF, NR, t}^{MR}} \right) GETF_{NR, t} \right]$$

$$CoGETFCAP_{NR} = WTPNETVP_{NR} \left( 1 - \frac{P_{NGETF, NR, t}^{NHM}}{P_{NGETF, NR, t}^{MR}} \right)$$

$$AGGSBSD = (SC\_SBSD) + (HYDPRDCR\_SBSD - NCPSALE_{SDRE}) + HYDCNSMR\_SBSD$$

# Closure

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Closure refers to tracing of Policy & Monetization impacts in the Financial & Monetary markets

---

AltKuznets Design for Green Hydrogen is Expansionary – Cause Finance Design leans on Sov. Bond, Bullion FV & PV, Long & Short Bond market as well as Money Market & FX

---

Dynamic Equilibrium traced across multiple markets & directional impacts noted.

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Requires significant assumptions & calibration

---

# REG OPPORTUNITIES IN GREEN HYDROGEN

- Administering NHM Bond, Unit Trading NCP allocations & Exchanges
- Diversion of Climate Subsidies to GH2-sourced Community Power & Storage
- Leveraging Hydrogen Sustainability Certificates at the Bullion Hedge
- Green vs Blue Hydrogen Differentiation at Bullion PE Hedge
- Resolution to Schump IPO Externality - The IPO Queue
- AltKuz Freight 'n Fly – the Schump Biz

# NCP BUY BACKS

- NGDP-sponsored Nominal Carbon Permits or Credits issued via Association to Sector Firm
- Sector Firms intending to fuel Switch to Green H2 may exchange them for NHM-supported advantageous pricing on Bulk Hydrogen contracts
- Exchanged Carbon Permits reduced at SDRE-Climate Bond.
- Strategy permits political allocation or policy tailoring of Fuel Switching across Sectors
- Alternatively, NCP-owning Sector Firms could internally trade NCPs by their social & economic contexts
- Our Strategy either obtains politically/policy-intended outcomes,  
Or Pareto transfers to other Sectors evaluating the Green Hydrogen Option

# The Energy Sustainability Coefficient

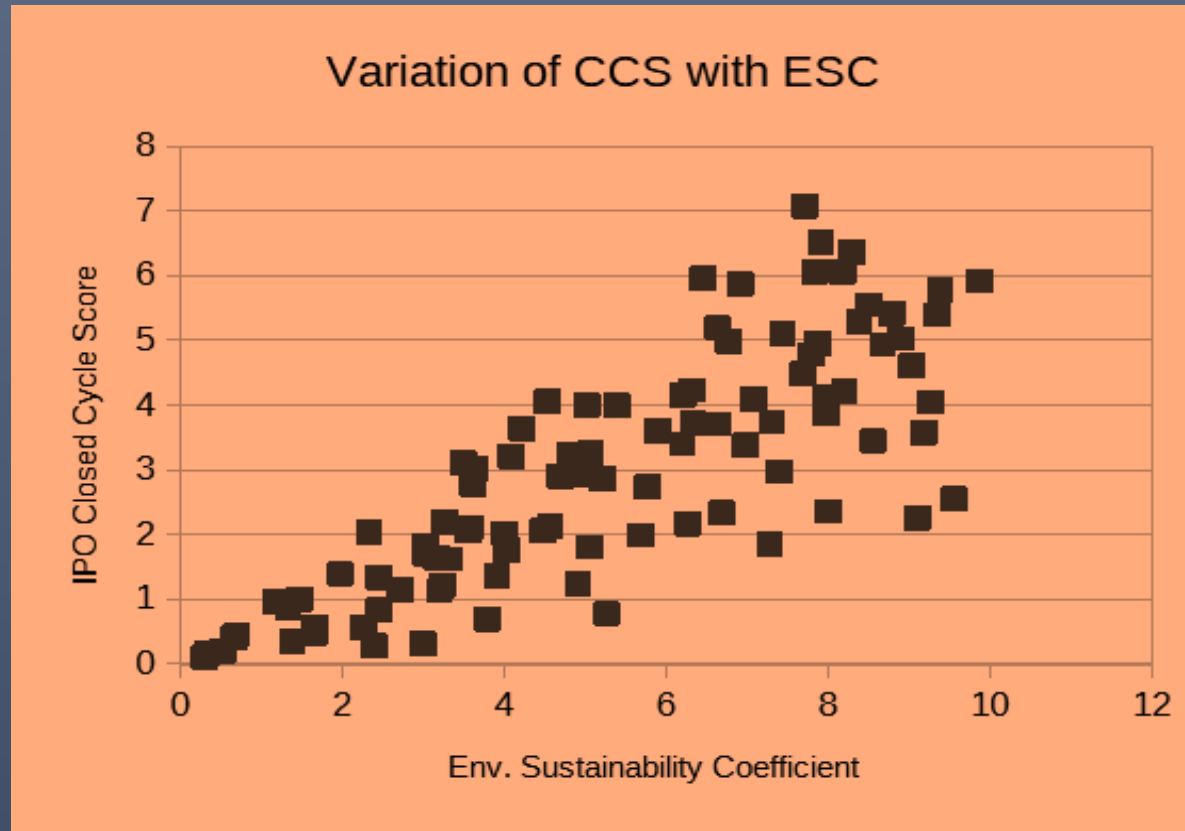
- AltKuz ESC regime: Quantifies Corporate Energy Sustainability with Energy Sustainability Coefficient
- ESC computed from Fuel Share and Energy Share for Multi-Fuel Consuming firms
- ESC could be a determinant of Bullion Hedge PE
- Firms w/ superior ESC rewarded with Long PE Floor Upgrade
- Hedge PE Upgrade reflects in Sustainable Dividends
- Strategy incentivizes Firms to prefer low Carbon Fuels such as Green Hydrogen, & gain Capital Market Upgrade
- On the aggregate, our Strategy obtains Sectoral & Market Sustainability Upgrades

$$Sh_f^E = \sum_j \left[ \frac{P_{jf}^E Q_{jf}^E}{C_f} \right]$$

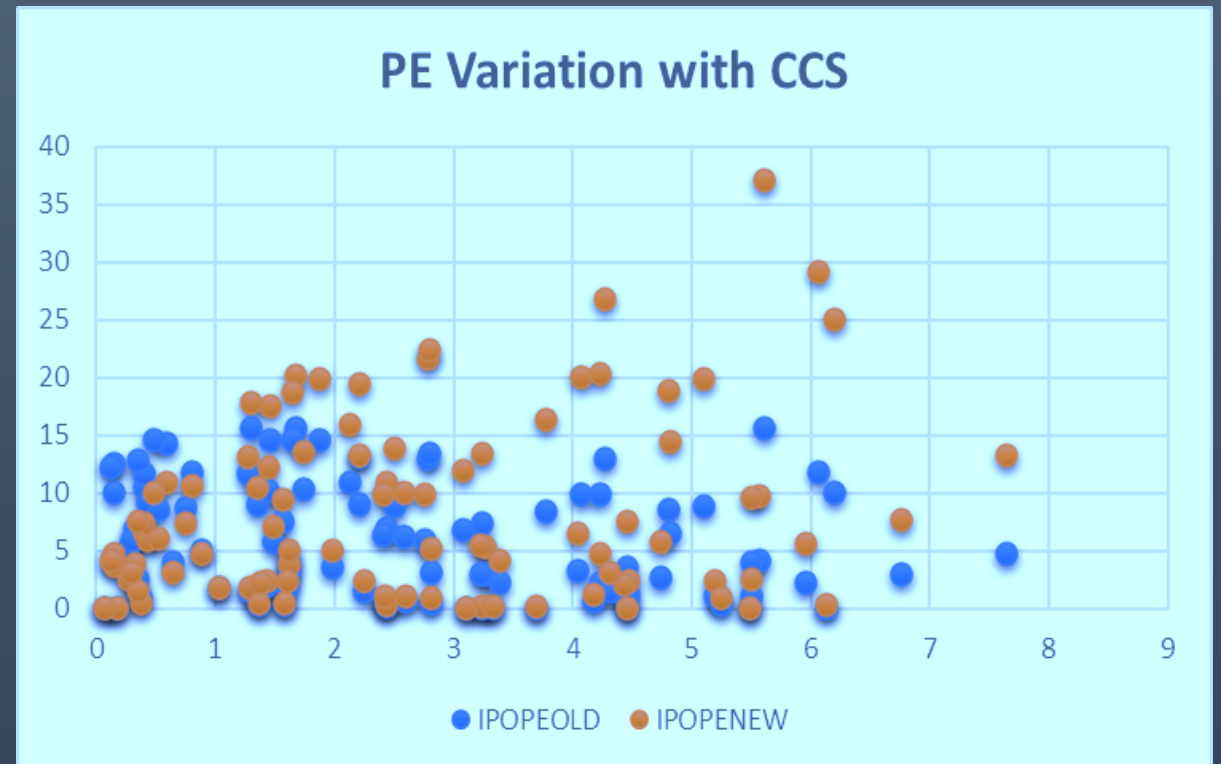
$$ESC_f = \left[ 1 - \sum_j Sh_{jf}^E CCE_{jf} \right]; \quad ESC_f \rightarrow 1 \text{ as } CCE \rightarrow 0$$



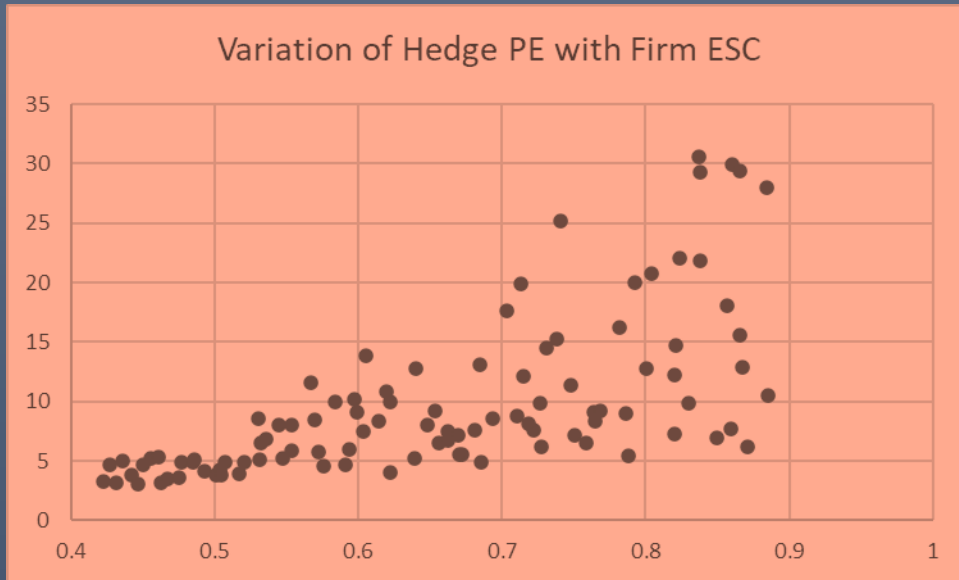
# IPO PE VARIATION WITH ENV. & TECHNOLOGY PARAMETERS



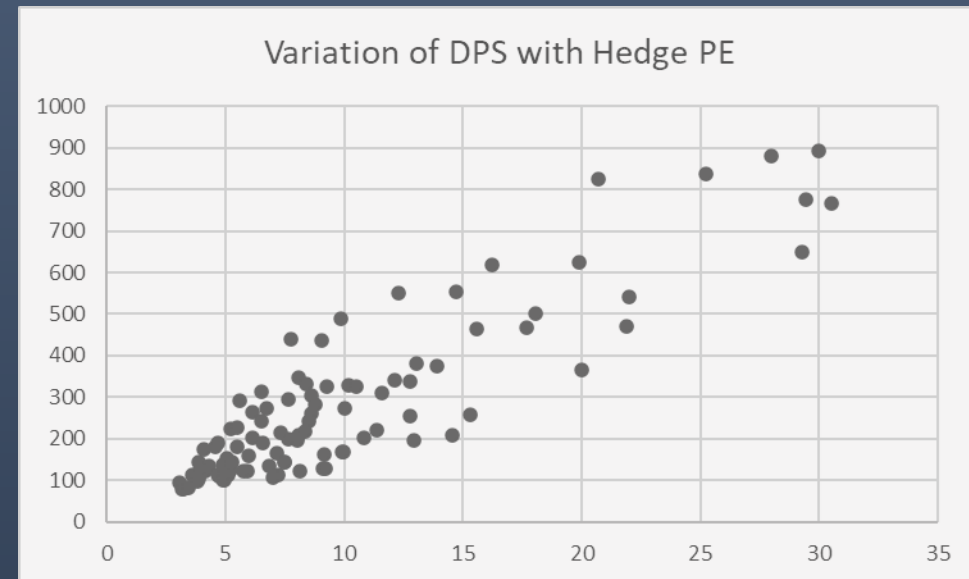
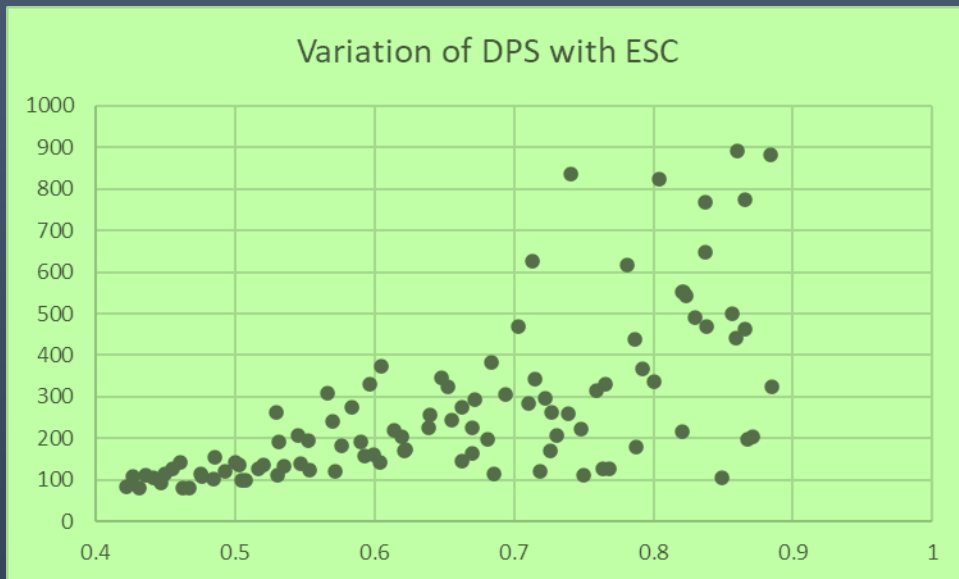
- PE influenced by many factors
- Bullion Hedge PE – focusses on long Sustainability
- ESC – Hedge PE Link induces intra-Sector competition
- Higher PE de facto obtains lower Cost of raising Capital
- Laissez Faire : PE uncorrelated with Env. Performance



# Leveraging Energy Sus. Coefficient in the Capital Markets



- Incorporating Energy Sus. Coefficient in Hedge PE section
- of the Bullion obtains
  - LR increments in PE
  - Sustainable Dividends
- Investments in ESC returned as PE Gains & DPS Upgrades
- Investments in ESC returned as lower cost of incremental Capital



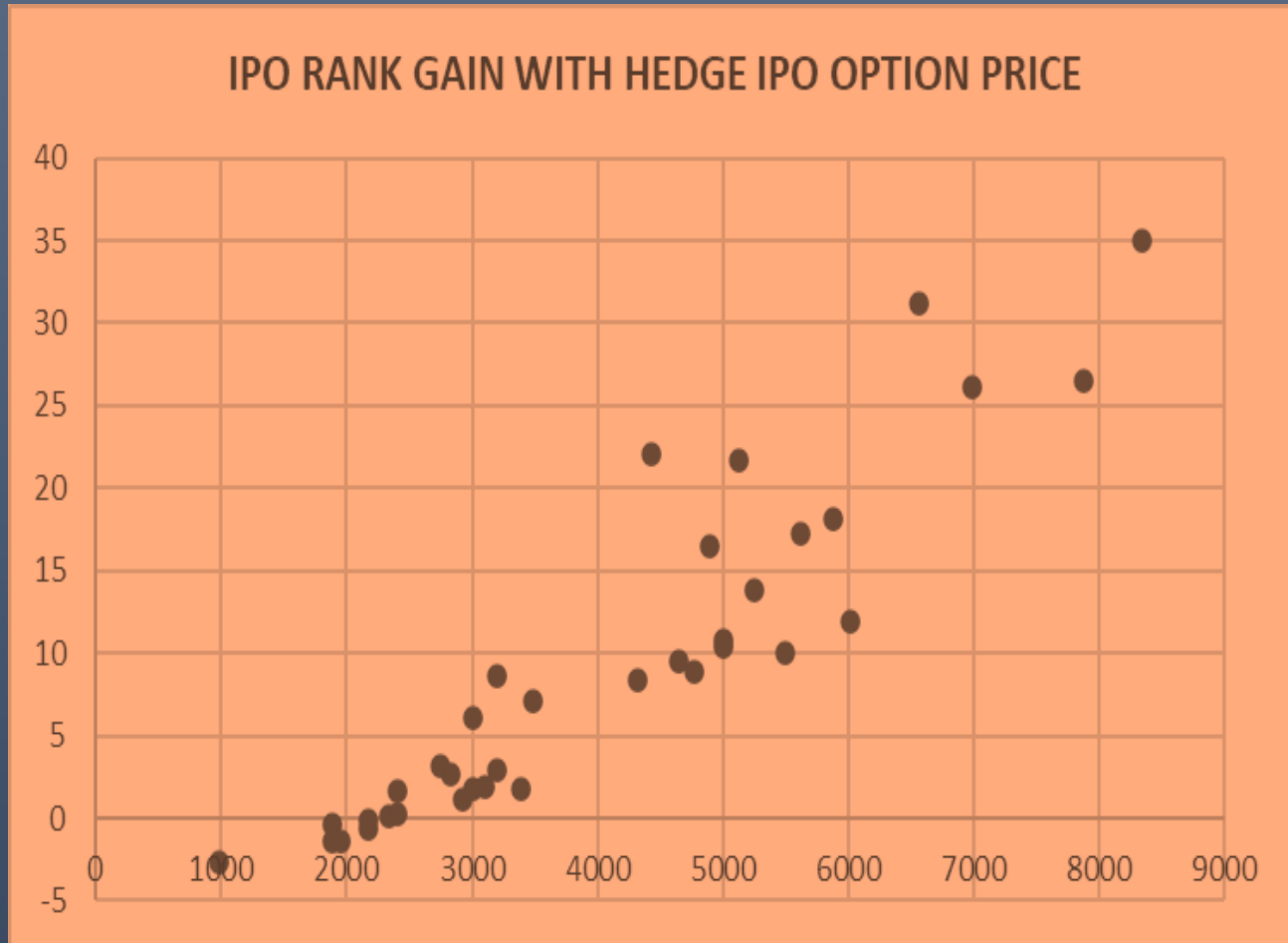
# The Schump IPO Externalities

- Rich Investors prefer reliable Dividends associated with Scale-advantaged Equities of Resource firms
- Households prefer Social streams from OpCy firms
- OpCy Resource Equities also issue Volatility lines to Income & Bond markets
- These factors bring about a Schump IPO Externalities
- (Green, OpCy-displacing) IPOs dominated & delayed by OpCy Resource Investors
- Delay in IPOs of Efficient (hi ESC) New Tech imply further exacerbation of Climate Irreversibility
- Applicable to IPOs of Energy-intensive Disruptive DY firm, ie, Sustainable DY Manufacturers of Essential Products with Inputs characterized by low Price & high Income Elasticity

# The Schump IPO Externalities - contd

- AltKuz suggests Issue of **Long Hedge IPO Options** to Market-inimical R&D Institutions & Patent Investors (RDIPI)
- Such IPO Options rise in Strike price with standardized Queue Rank of Green IPOs as determined by IPO GHES & DY Elasticity
- IPO Options rise in Price & discharge in the Mirror of Bulk trades in OpCy Equities
- They issue a global Punitive Monetize Fractal (Schump Fractal AO Mirror) to Sus. CC Patents & Green IPO Hedge Investors
- Strategy induces the Investors to fast-forward Green & Efficient IPOs
- Strategy stimulates the Schump revolution in Capital Markets

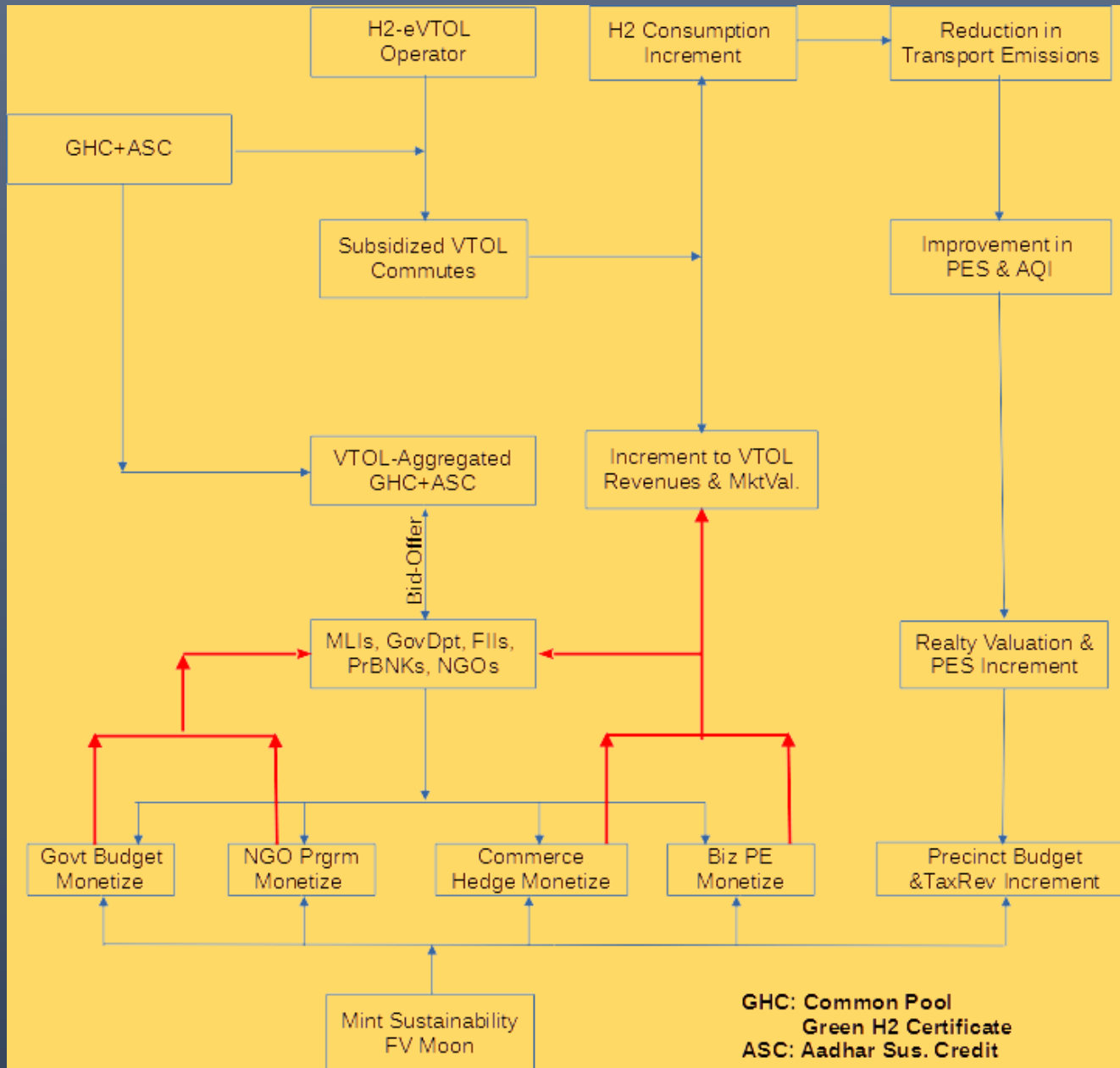
# MAKING THE SCHUMP COUNT AT THE IPO COUNTER



- **Hedge IPO ZS Option Strike Prices correlated with Median Position of Green Hydrogen IPOs**
- **Strategy induces Investors to fast-forward Sustainable and DY Technologies**
- **Strategy may additionally be embellished with GHES calibration such that low GHES implies lesser Wait Time in the IPO Queue**

# Freight 'n Fly – the AltKuz Schump Biz

- Combines Env.Schump with Biz Opportunity in Aviation Sector
- *Scale Opportunity* to adopt (Bond-incentivized) Liquid Hydrogen for Surface Freight & Aviation
- *Ocean Seeding* Scope Opportunity with Green Lime
- Fossil Fuel Surface Freight Operations bought away with Schump Line – Significant Environmental Benefits



## • Green Hydrogen-powered Flight obtains:

- Schump Lines to attenuate FF Freight Ops
- Improvements to PES & AQI
- Increment to Realty Valuations
- Status-leveraged Flight Subsidies & PE Upgrades in Personal Transport Space
- An Option in Ocean Seeding

# GREEN HYDROGEN CREDITS – A REBUTTAL TO CARBON CREDITS

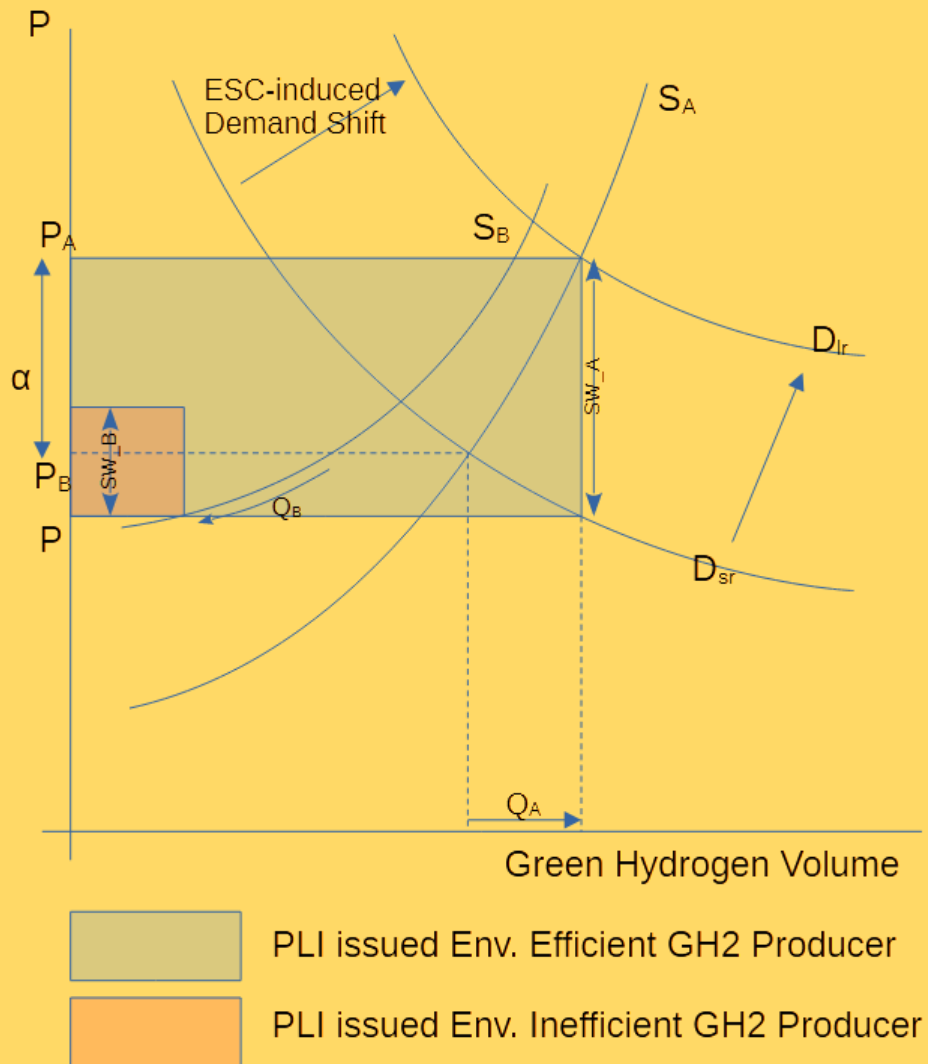
- Carbon Credits sourced from Frontier Economy (Voluntary), or Core DY Economy (Regulatory)
- Net Zero Carbon Credits attenuate & extend Carbon Regime, but no ultimate Climate Sustainability
- GH2 Credits, GHCs, sponsored by Renewables Bond/NHM to Producers
- Schump Capital-advantaged GH2 Producers issue GHCs to HiVal Consumers
- GHCs encrypt information on Electrolyte & Catalyst Efficiency
- Consumers claim Social Offer upon return of GHCs to Climate Bond
- Renewable/Climate Bond monetizes GHC FV to Producer against IPR Infract w/ variable PLI PV & Bond Schump Capacity Incremental BV



# GREEN HYDROGEN CREDITS – A Rebuttal to Carbon Credits

- **PLI-advantaged Producers produce at full Capacity (GHES Intrigue)**
- **Social Offers retain Consumers**
- **Schump Dollops induce shift to most efficient Electrolyte & Catalyst**
- **Producers leverage Schump Prerogatives & Privileges to expand Capacity globally**
- **GHCs meant to pre-empt issue of Carbon Credits on GH2 production**
- **GHCs imbue Private Producer Information in encrypted form. Infraction of Producer**
- **Confidentiality facilitates monetization of imbued Sustainability FV in to**
  - Variable PLI Schump PV → GH2 Producer – the Sustainability Wedge
  - Local Social Offers ... issued to Consumers with a House EV Tail
  - Schump Bakey → CC Friends
  - Schump Incremental BV → Private Schump Capacity –ZS- Public Bond NAV

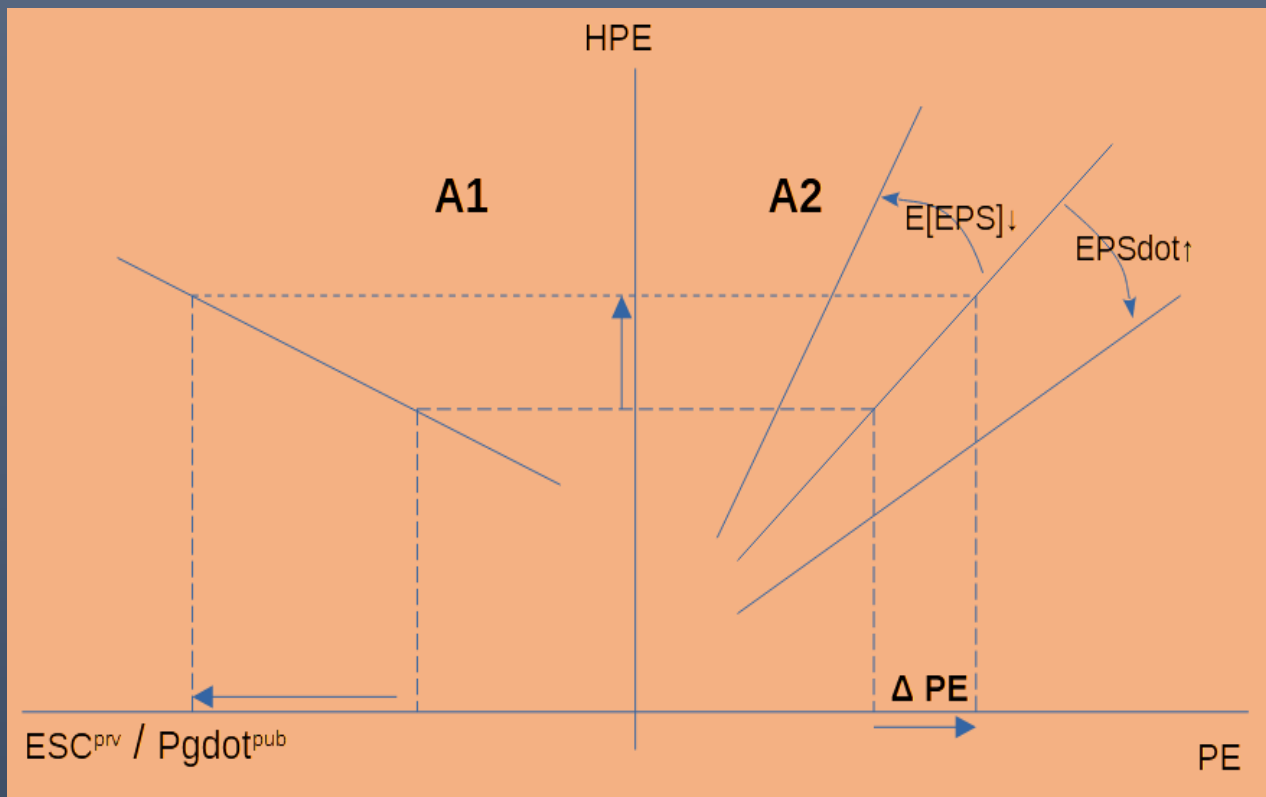
### PLI & ESC-shifted Supply Demand for GH2



## HTECH-calibrated PLI for GH2 Producer Firms

- PLI obtained from Bond-monetized Sus. FV in GHCs
- PLI calibrated to Schump Efficiency variables (Elec, Catalyst).
- Firm with Frontier Technology obtains a larger PLI
- PLI reflects in market as a Producer-controlled Sustainability Wedge (apply Non-Rev stream to Market)
- Low Prices to Consumers; Rev & Schump Rent to Producers
- PLI induces all Sector firms to seek better GH2 Technology
- PLI induces maximal Capacity Utilization, thus favoring the Environment (GHES Intrigue)

# Green Hydrogen Sustainability Differential



- Carbon Credits obtain un-earned reprieve for Fossil Fuels in Capital Markets
- Necessary to counter TBTF Fossil Fuels with Sustainability PE Differential
- AltKuz suggests ESC-calibrated Bullion Hedge PE instrument
- Hedge PE reflects long-run, Sus. PE Floor
- Hedge PE increments (Sustainability Wedge) with Private ESC & shrinks with Public Pg inflation
- Hedge Strategy induces Energy-consuming Firms to prefer Renewables (& lower Pgdot)
- DPS increments with Hedge PE, thus attractive to Income Funds
- Higher Margins reflect in PE Upgrade-obtain lower cost Capital for expansion of GHCapacity

$$Sh_f^E = \sum_j \left[ \frac{P_{jf}^E Q_{jf}^E}{C_f} \right]$$

$$ESC_f = \left[ 1 - \sum_j Sh_{jf}^E CCE_{jf} \right]; \quad ESC_f \rightarrow 1 \text{ as } CCE \rightarrow 0$$

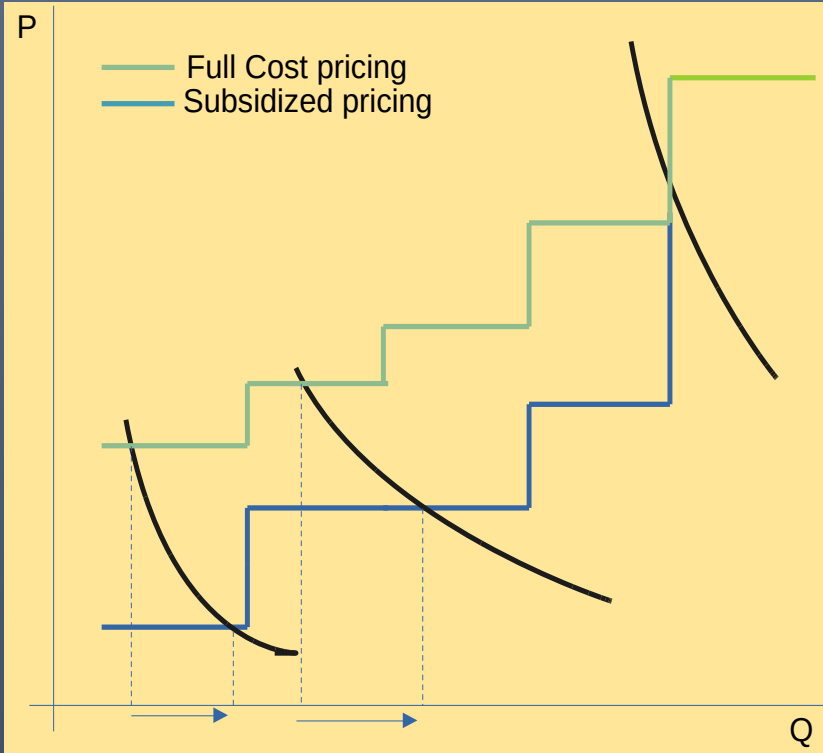
# BIZ OPPORTUNITIES IN GREEN HYDROGEN

- Green Hydrogen EV Bundles - Hydrogen Sustainability Certificates  
- leverage for Precinct, Personal Status, & Market gains
- GH2-sponsored Freight N Fly Schump H2eVTOL strategy
- Community Power & Storage for Community Bus Fleet Charging
- Hydrogen-pumped Hydro Storage
- GH2-sponsored 'Floodgates BESS' for co-located H2eVTOLS, Flying Cars & Electric Trucks
- The FLEX CAP Strategy
- Precinct-networked CPS 'IPO Favor Group'

# COMMUNITY POWER & STORAGE

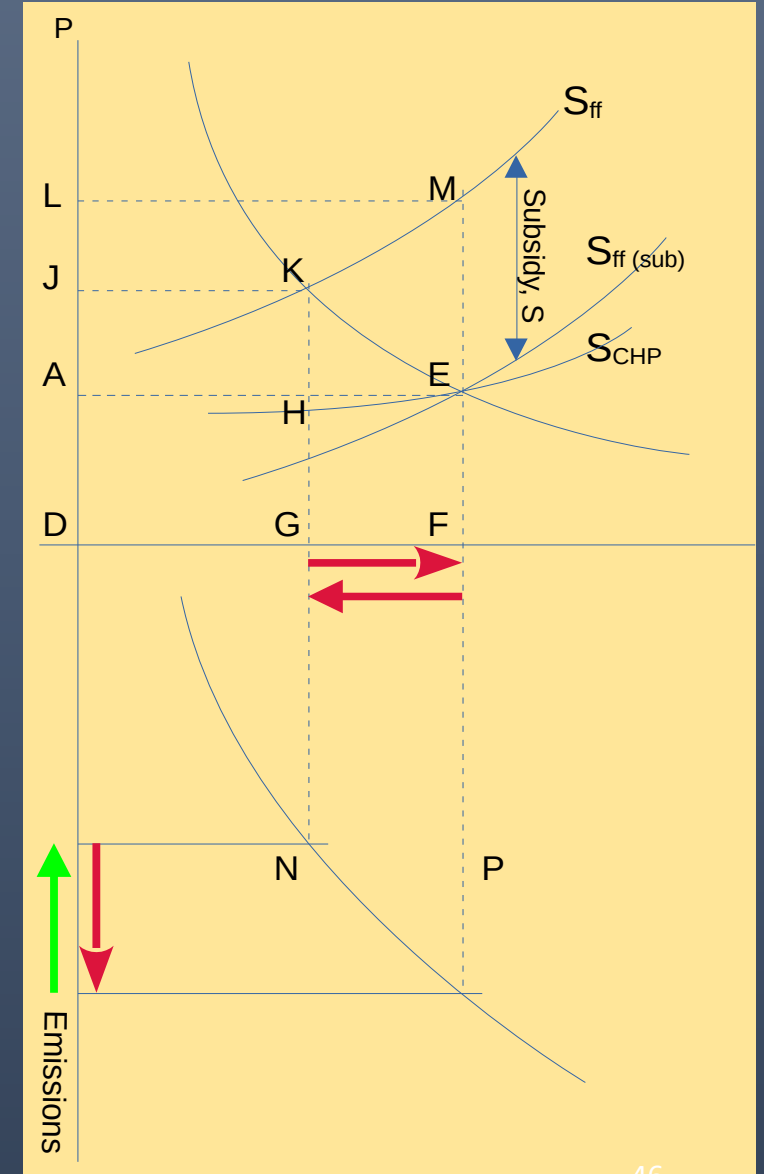
- **Many Precincts have adopted Electricity Subsidies**
  - **Locally, 'Threshold or Climate units' are charged at Zero**
  - **Units above threshold subsidized 'progressively'**
- **Subsidies add to Scale & Revenues of Fossil Fuel Producers**
  - **Extend Carbon Regime & exacerbate Climate Change**
- **Technological Opportunity for Green H2 Community Generators (GEH2/Gaussin)**
- **Coupled to Roof-Top, BESS, Portable Solid State Battery & Bus Fleet Charging, CPS could replace FF-Power and claim those Subsidies**
- **Potential to group CPS across ZipCodes in to 'IPO Favor Group' & favor them with early Capital in 'Precinct Follow IPO' (behind Large IPOs that could subtend CPS Land Capital).**

# Power Consumption Subsidy & Emissions – with Fossil Fuels & Green Hydrogen



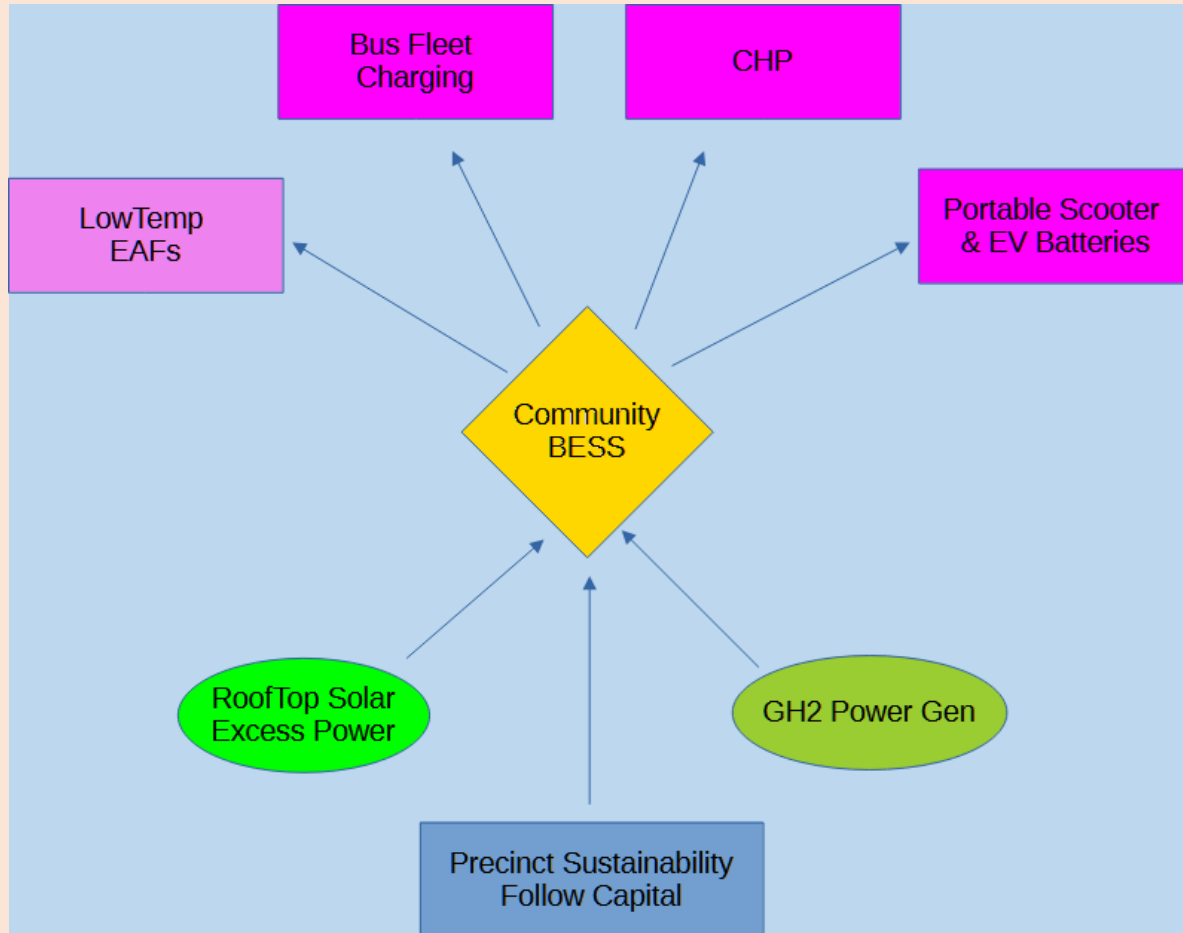
- Utilities subsidies Consumption in the lower income bracket
- Subsidy-induced Consumption exacerbates emissions
- Many Societies on verge of offering subsidy on Climate-related AC Consumption
- Likelihood of GHG emissions increasing with spread of AC Subsidies

- AltKuznets suggests adoption of Community Green Hydrogen Fuel Cell Power (GHFCP) Generators (Gaussin & GEH2)
- Land-favored Community GHFCP Generators could substitute subsidized Community Power
- Best with attached BESS, Charging Solid State Batteries & Bus Fleet Charging



# COMMUNITY GREEN POWER GEN & BESS

## MULTI-END USE MODULES



Ref: GEH2 & Gaussin

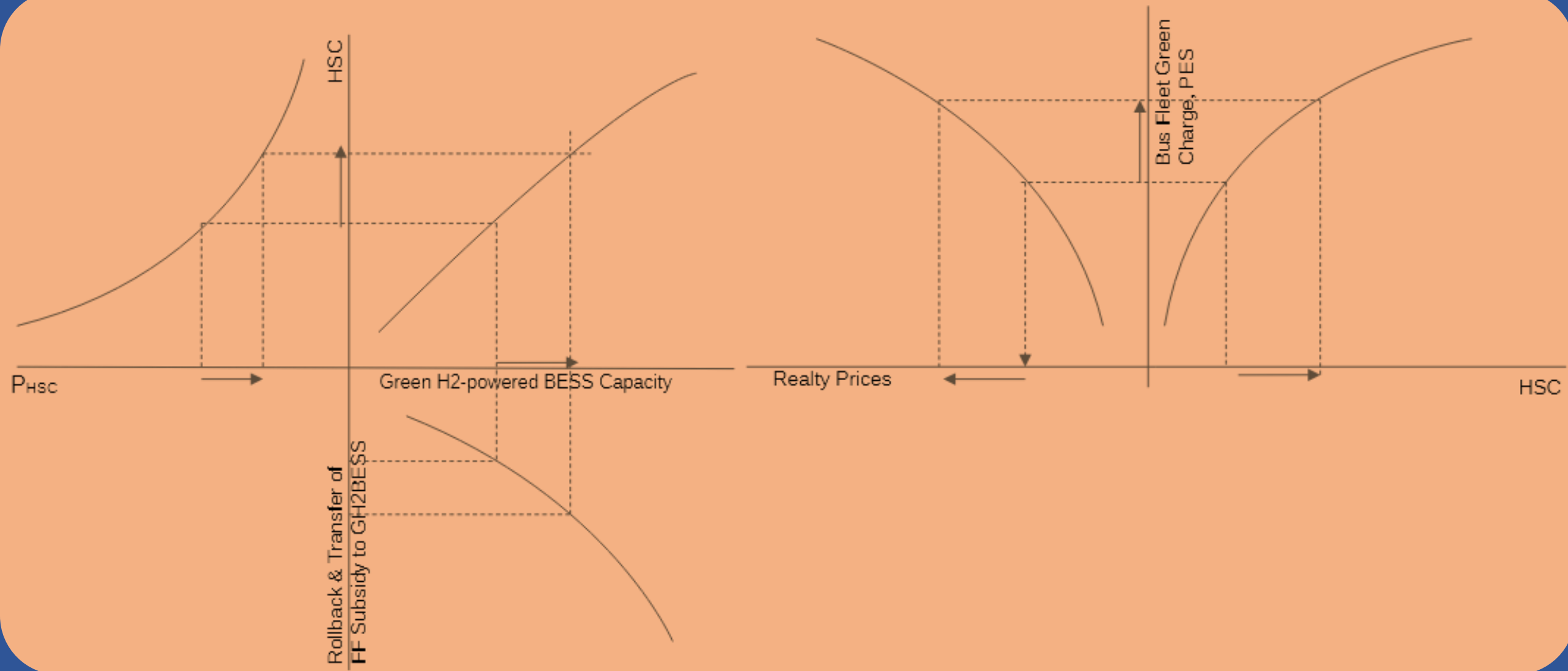
- Low Cost Public Follow Sustainability Capital
- Lowest Cost Ren. & Excess Power Supply to Internal BESS
- Hi Value EV Convenience from vending Charged LFP Portable Scooters & EV Batteries
- Mid Value Deals to Bus Fleet Charging
- Lo Val Volume Deals to CHP / LowTemp EAFs
- Strong economic Pareto between Precinct Residents, LQ Power Consumption, RoofTop Solar use, Charging of EV Buses & CHP & Issue of GHC
- Unmatched Widespread Potential to increment Env. Sustainability

# GREEN HYDROGEN EV BUNDLES

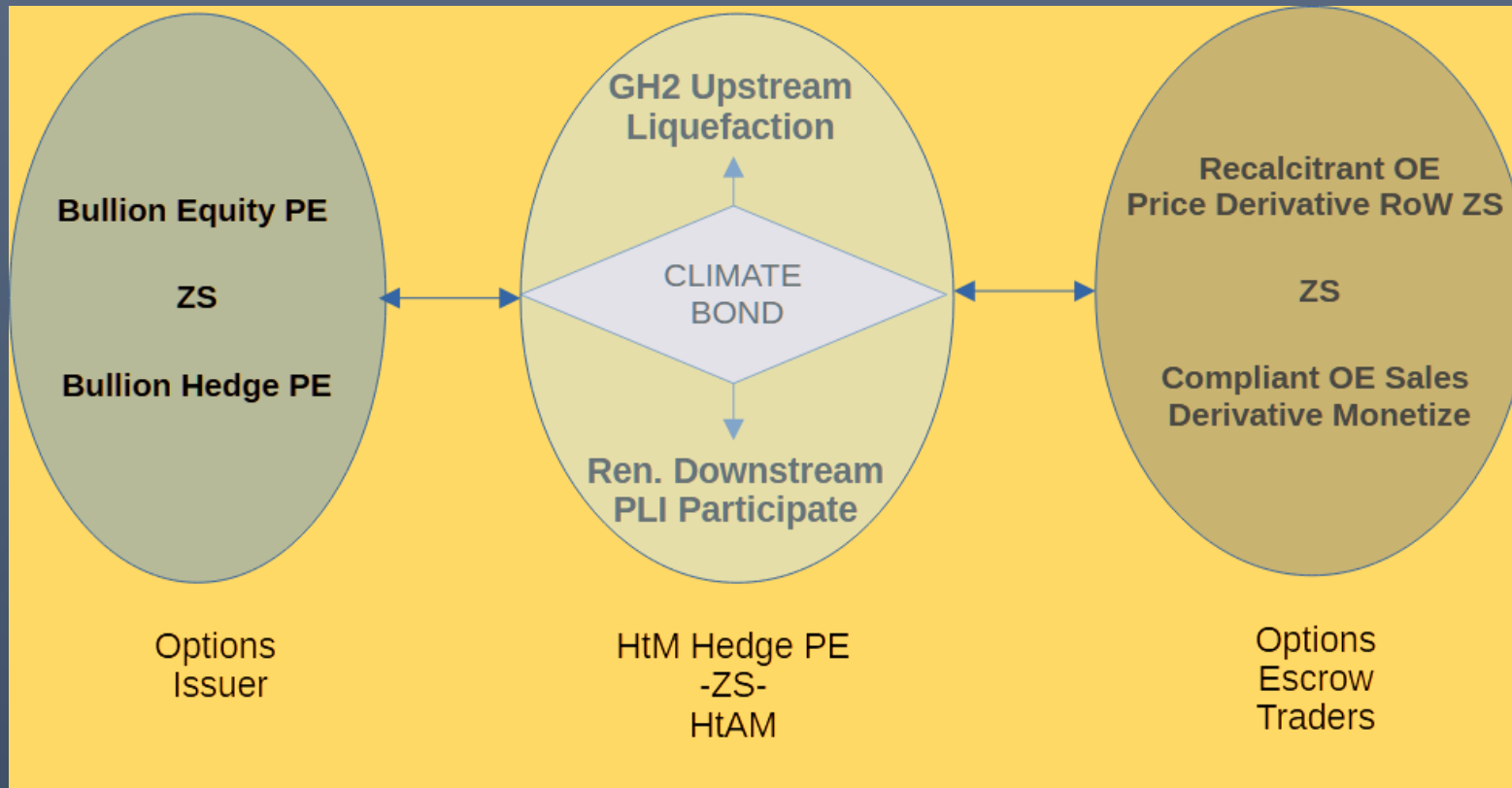
- **EV Fleet Owners & Lease Purchasers may buy Green H2 EV Bundles. Green Hydrogen EV Bundles obtain Durable Cost & Consumables Subsidy for EVs**
- **Green Bundles could be sourced from networked Community GH2 Power & BESS Systems**
- **Distributed Sourcing would maximize Technology Index-calibrated PLI Outgoes**
- **Necessary to seek Community Aggregator Services that coordinated sourcing and issued or honored Green Hydrogen Bundles locally**



# HYDROGEN SUSTAINABILITY CERTIFICATES



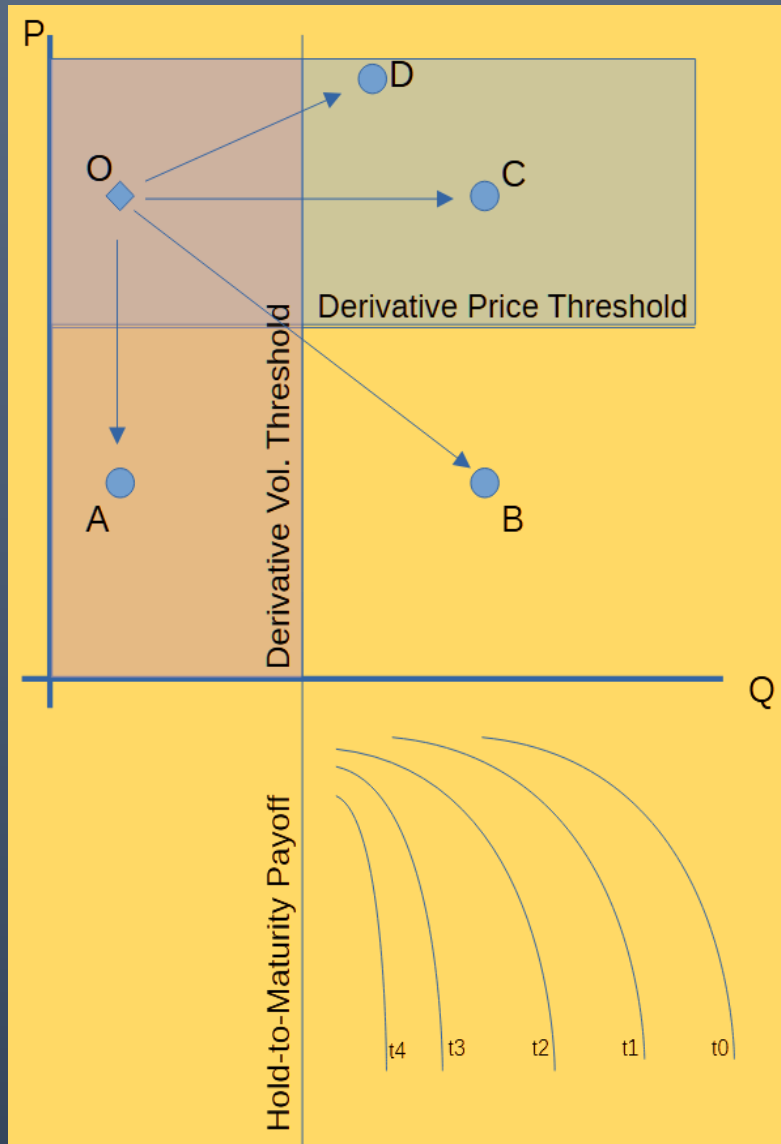
# The AltKuz FLEX CAP ... An Alternative to the Net Zero



- Climate Bond hedged in Derivative on CO2 Plateau
- No Hold Price Options issued Recalcitrant OE
- No Hold Volume Options issued Compliant OE
- Hold-to-Maturity Options issued Climate Bond
- Climate Bond issues HtAM to Liquefaction & PLI Interests

- Boosts Low Carbon Liquefaction facilities & GH2 Producers with Derivative Pound Cake.
- Climate Bond-financed Liquefaction facilities expedite transition to Green Aviation, and obtain early Climate Sustainability

# The AltKuz FLEX CAP ... contd



- Fossil Fuel Price Floor & Volume Cap Derivatives
- WWF-CB hedged in Derivative of CO2 Plateau opp Global NGDP Bond Fractal
- Bullion-Bullion Hedge issues 'HtM' Options to WWF-CB opposite NoHold Options issued Trader Group
- WWF-CB issues HtAM ZS Mirror to Liquefaction & PLI constituency
- Traders 'Bulk-Cancel' HtAM Mirror Derivatives with Trader Group prior expiration for a shared Derivative Pound Cake
- WWF-CB reconciles Volume exceedances against (Sector) Hedge PE while forcing its gain against the NGDP Bond Frctl

# The AltKuz FLEX CAP – an Alternative to the Net Zero

- Green Hydrogen compatible for blending with LNG at Gas Turbines
- Blends generate NOX emissions at Scale due high Flame Temperature
- CO2 & NOX Emissions disadvantage Gas Turbines despite Efficiency
- Flex-Cap participating GH2-Producers could issue PLI-generated CO2 & NOX Credits to GH2-NG Turbines w/ GH2 Blends
- GH2-blended Gas Turbines useful with falling Power prices & dynamically-tighter Carbon Cap

# The AltKuz FLEX CAP ... contd

- The **Carrot & Stick Olive Branch** would cost OMCs at the Bond, but obtain Long PE (basis point) increments at Bullion Hedge
- OMCs incentivized to resort to Fuel Volume-limiting Price Strategies
- OMCs gain Long PE for instead marketing **Green** H2 Liq & EV Bundles
- OMC reaction to incentives is effectively a **Flex Cap on Fuel Sales**
- Climate Bond applies Options Revenues to sponsor Schump Incentives
- Bond leverages Flex Cap to claim CO2 & NOX Credits on GH2EV Bundles
- CO2 & NOX Credits offered GH2-LNG Gas Turbines
- Gas Turbines generate Climate & Air Quality Sustainable Power
- Turbine Operators may bid higher prices for Sustainable Power at EX

# RECAP

- Alt NHM conceived as a Green-Hydrogen Biz-friendly model with Socio-political Latitude
- AltNHM NAV linked to Employment, Competition, Capital Issual, Hydrogen Capacity & Sales & GDP VA. AltKuznets Cause Bond is a balance between Social Equity, Competition>Returns, & Env. Efficiency/Intents.
- AltKuz National Hydrogen Mission is a Benevolent Monopsony-Monopoly that'd solve Climate Sustainability with the Climate Bond
- AltKuz Design offers anticipatory Hydrogen monetizations toward Public Capital Participation
- Cost of Hydrogen Capital linked to GHES, Climate Change projections & State of Hydrogen Technology

# RECAP

- AltKuz suggests PLI, FLEX CAP & 'Groan Load' be calibrated in GHES
- FLEX CAP is a Climate Bond-administered Market Cap on Fossil fuels
- CO2 Emission Format and level in GH2 Production is a Macro Concern
- Energy Consumers incentivized to seek & turn in Carbon Permits to obtain better Pricing on GH2
- Link Consumption of Green Hydrogen EV Bundles to Equity Closed Cycle Score, & Hedge PE – obtains reward in Capital Markets
- Unique Opportunity to socially-, environmentally-, financially- and dynamically optimize Green Hydrogen Sector
  
- IT-intensive; Opportunity for IT Firms
- Financially-strategized; Opportunity for Finance Firms
- Macro-Regulatory; Opportunity for Regulators & Sector Associations

CERTIFICATE NO:  
DIPP122772



सत्यमेव जयते  
Government of India  
Ministry of Commerce & Industry  
Department for Promotion of Industry and Internal Trade

#startupindia

## CERTIFICATE OF RECOGNITION

*This is to certify that Alt Kuznets Sustainability Advisors (OpC) Private Limited incorporated as a Private Limited Company on 25-05-2021, is recognized as a startup by the Department for Promotion of Industry and Internal Trade. The startup is working in 'Finance Technology' Industry and 'Advisory' sector as self-certified by them.*

*This certificate shall only be valid for the Entity up to Ten years from the date of its incorporation only if its turnover for any of the financial years has not extended ₹ 100 Cr.*

Received in to AltKuznets S.A.Pvt Ltd



10-02-2023

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24-05-2031

VALID UPTO



# Meet the Team, err..... its Founder-Owner-Director !

[director@alkuznetsadvisors.com](mailto:director@alkuznetsadvisors.com)

<https://www.linkedin.com/in/prasad-rao-b839b03b/>



**PRASAD RAO, PHD  
DIRECTOR**

Title

## Contact Us



**ALTKUZNETS SUSTAINABILITY ADVISORS PVT LTD**

**An MCA-Registered OPC**

**GST: 33AAVCA2633H1ZN**

**Biz-related**

**[director@alkuznetsadvisors.com](mailto:director@alkuznetsadvisors.com)**

**+91-9092790914**

**Order Support**

**[support@alkuztransact.com](mailto:support@alkuztransact.com)**

# ALTKUZNETS SUSTAINABILITY ADVISORS PVT LTD



*Your Sustainability Nirvana !*

Our Online Office:

- <https://alkuznetsadvisors.com>

Biz Website

- <https://alkuztransact.com>

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