# CleanStart Vehicle Exchange Program Concept

## Why?

Approximately 1.7 million vehicles (53% of B.C.'s light-duty fleet) are model year 2014 or older. Each emit on average 4.0 tonnes of GHGs per year. Of those, 63% only meet Tier-2 (or worse) standards. These vehicles are the least efficient and will keep emitting to an average of 20 years. Continued ICE sales (both new and used) as well as used imports all contribute to persistent emissions in B.C. Continued, emissions from ICE vehicles are a major contributor to transportation sector carbon emissions targets not being met.

*"The province's progress towards sectoral targets, however, are not being met. In fact, transportation sector emissions, as confirmed below, have increased between 2007 and 2023, despite the number of ZEVs on the road, and the incorporation of renewable fuels as required under the LCFS*."[1]

Recent volatility in ZEV incentives (2025–2026) demonstrates that ZEV adoption is sensitive to financial support, creating a risk to LCFS performance.

The LCFS's original modelling and ultimate success heavily relies on ZEV uptake, "*a Low Carbon Fuel Standard (LCFS) becomes less effective—and eventually ineffective—if ZEV uptake does not reach the levels assumed in the model. This implicitly means that additional compliance pathways (i.e., more flexible credit options for fuel suppliers/oil industry) would be necessary if ZEV adoption stagnates*."[2]

[1]Province of British Columbia. (2025). *Climate Change Accountability Report 2025* (p. 11). https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/CleanBC/2025_climate_change_accountability_report.pdf
[2] Lepitzki, J. (2017). Designing a low carbon fuel standard to achieve deep GHG reduction targets: Insights from an energy-economy simulation model of British Columbia (Report No. 663). Simon Fraser University.



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Under the LCFS the original thinking was that oil companies would build their own ZEV charging networks to "self-generate" credits. This option, however, relies on a high growth in sales of ZEVs year over year.

| Year | Weak | Moderate | Ambitious |
|---|---|---|---|
| 2015 | 0% | 3% | 3% |
| 2020 | 0% | 12% | 14% |
| 2025 | 0% | 20% | 25% |
| 2030 | 0% | 25% | 30% |
| 2035 | 0% | 35% | 40% |
| 2040 | 0% | 45% | 60% |
| 2045 | 0% | 55% | 80% |
| 2050 | 0% | 65% | 100% |

*"As of April 1, 2026, more than 238,000 light-duty zero-emission vehicles are registered in the province, up from more than 3,000 in 2015."*[3]

With over 3.2 million registered light-duty vehicles on the road in B.C. as of December 31, 2024, and predictions of that number not changing significantly in 2025 or 2026, 238,000 represents approximately 7% of the total light-duty fleet.

This suggests more could be done to support ZEV adoption.

The CleanStart Program can support:

- the continued growth/sales of new ZEVs;
- used ZEV vehicle sales;
- an income-tested program design;

and most importantly, will not create a burden on taxpayers.

## What problem does CleanStart solve that isn't already being solved?

- LCFS helps decarbonize fuels.

[3] Government of British Columbia, Ministry of Energy and Climate Solutions. (2026, July 21). *Tripling public charging network by 2035: Provincewide expansion will deliver faster, more convenient charging for EV drivers in B.C.* https://news.gov.bc.ca/releases/2026ECS0041-000855



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- ZEVA helps increase ZEV supply.
- CleanStart addresses the gap:
    - continued high emission from the long-lasting ICE fleet;
    - links what enters the fleet with what leaves the fleet; and,
    - provides a potential future compliance option tied to accelerated fleet turnover.

## Concept

The CleanStart Program aims to be a transportation-sector decarbonization and LCFS compliance pathway. Emission reductions would not overlap with existing LCFS electricity, hydrogen, or renewable fuel credit generation. The program would create measurable carbon reductions that support transportation decarbonization. Unlike fuel switching, this program permanently eliminates emissions sources.

- Permanent retirement of ICE vehicles.
- Reinvestment of revenue from credit sales into rebates.
- Provide rebates for both (new/used) but focus higher rebates on used ZEVs.
    - Higher rebates for used creates demand.
    - Lower rebates for new maintains demand.
- Allowing the used ZEV option mitigates the affordability gap.
- An income-tested component can also be incorporated.

## Benefits

- Supports CleanBC's sector-wide decarbonization goals as it compliments both ZEV mandates as well as the LCFS and addresses the gap.
- Aligns with *California's Clean Cars 4 All* where the "California Climate Investments the statewide umbrella that distributes funds generated by California's Cap-and-Trade Program."[4]
- Supports accelerated fleet turnover which is essential for climate-aligned transportation policies[5].
- Permanently ends continued emissions created by currently registered ICEs.
- Helps to limit ICE "stock" available for resale.

[4] California Air Resources Board. (2025, May 7). *California dedicates nearly $33 billion to climate solutions, using money from the Cap-and-Trade Program*. https://content.govdelivery.com/accounts/CARB/bulletins/3df6487
[5] Naumov, S., Keith, D. R., & Sterman, J. D. (2022). *Accelerating vehicle fleet turnover to achieve sustainable mobility goals*. Journal of Operations Management. https://doi.org/10.1002/joom.1173


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- Program design supports dealers to find and import used ZEVs (a ZEV Act Initiative Agreement credit pathway[6]) instead of used ICEs, while supporting lower-income purchasers on two levels:
    - Offering higher rebates for used ZEVs.
    - Applying an income tested approach.
- Supports the transition of the used car and repair industry to slowly shift inventory and (and much needed) repair focus to ZEVs, and away from ICEs and provides a potential pathway for used ZEV batteries.
- With a 20-year average ICE vehicle life in B.C., cutting vehicle kilometres travelled delivers immediate, compounding reductions.[7]
- Creates permanent GHG reductions that do not have to be offset by some other program, source, or cost.
- Dealers across B.C. would be supported by rebates for both new and used ZEVs.
- With a reasonable allocated credit allowance per transaction under a supported Initiative Agreement, no rebate or administrative funding would be required from the province (taxpayers) to operate the program.
- The province may want to consider mandating retired government fleet ICE vehicles go to the CleanStart program vs. auctions or other sales methods, which allow ICEs to re-enter BC's market (i.e. via the pursuit of highest dollar value).
- Quick start. A new program could be launched within 60 days of approval.

### Fuel Supplier Benefits

- The program could provide an additional pathway which supports LCFS compliance and helps mitigate long-term compliance risks.
- CleanStart complements fuel-supply pathways by directly reducing the stock of high-emitting vehicles that continue to generate emissions despite ongoing LCFS carbon-intensity reductions.

## Why the Federal Clean Fuel Standard Supports Credit Reinvestment into ZEV Rebates

### Positive Reinforcement Loop

[6] British Columbia Ministry of Energy and Climate Solutions. (2026, February). *Zero-Emission Vehicles Act and Regulation – Initiative Agreements: Information Bulletin-ZEVA-003* (Information Bulletin No. ZEVA-003). Government of British Columbia. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/electricity-alternative-energy/transportation/zev_act_regulation_initiative_agreements_info_bulletin_3.pdf

[7] Streetsmart. (n.d.). Vehicle miles traveled. Retrieved from https://www.thinkstreetsmart.org/vehicle-miles-traveled.html [theicct.org]



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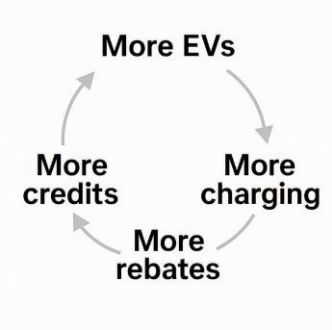
The Clean Fuel Standard's allowance to reinvest ZEV charging credits into additional ZEV rebates creates a powerful positive self-reinforcing cycle where greater ZEV adoption generates more credits, which in turn funds further charging infrastructure, which supports and promotes adoption, accelerating market momentum without ongoing taxpayer support.




Simply put, clean technology adoption funds further growth.

### Addresses Key Barriers

Credit-linked rebate provision directly addresses key barriers, especially higher upfront costs, by channeling carbon market revenues into price reductions that make ZEVs more accessible while also enabling investment in ZEV charging infrastructure deployment.

### Enhances Political & Fiscal Practicality

The structure enhances political and fiscal practicality by making ZEV incentives largely self-financed through compliance payments from high-emitting fuels, reducing reliance on taxpayers ("paid for by the polluters"), which strengthens long-term policy durability and public acceptance.

## Supporting the Intention of an Initiative Agreement

*NOTE: The following is not intended to represent a complete submission for approval of an Initiative Agreement, but rather, commentary on how the proposed program could meet the requirements.*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## Overview

Avoided emissions, consistent with lifecycle assessment principles, equal the emissions the vehicle *would have* produced had it continued operating for its expected remaining life.

- Because the LCFS sets mandated CI reduction schedules for all transportation fuels, this program would ensure continual reductions in the average carbon intensity of the overall transportation fuel pool.
- This program represents an evolution of existing LCFS Initiative Agreement pathways. It provides an approach to accelerating the transition to zero-emission vehicles (ZEVs) potentially beyond regulatory mandates. It would stimulate the market for ZEVs (particularly used ZEVs) and the associated infrastructure.
- This approach builds on concepts previously recognized through Part 3 agreement while adapting them to current transportation-sector decarbonization objectives.
- The science hasn't changed. The majority of emissions benefits are derived from permanently retiring a high-emitting ICE vehicle which eliminates its future fossil fuel consumption. (Reference: *Proposed Tiered Carbon Credit Structure & Calculations.xls).*

| **Age Group** | **Estimated Lifetime Benefit (tones)** |
|---|---|
| 1999 and older | 58.0 |
| 2000-2004 | 60.9 |
| 2005-2009 | 63.7 |
| 2010-2014 | 62.5 |
| 2015-2024 | 63.2 |

Conservatively estimated net emission reductions range from approximately 58 to 63 tonnes per transaction depending on vehicle age, average kms driven per year, fuel consumption rating, and life of benefit.


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## Baseline

- The baseline scenario takes into account that in the absence of the CleanStart Program, an eligible ICE vehicle:
    - would remain on road in B.C.,
    - continue consuming fossil fuel, and
    - continue generating greenhouse gas emissions until it's natural end-of-life.
- Many light-duty vehicles in B.C. remain operational for 20 years or longer.
- These vehicles continue generating GHG emissions through ongoing gasoline or diesel consumption.
- While the Low Carbon Fuel Standard (LCFS) is expected to reduce the carbon intensity of transportation fuels over time, the combustion of those fuels would still result in substantial lifecycle emissions until the vehicle is naturally retired.
- Analysis of B.C.'s existing fleet suggests that significant future emissions remain embedded within the current fleet, even under the published LCFS carbon-intensity reduction schedule.
- Emission reductions generated by the CleanStart Program are quantified as the difference between:
    - the lifecycle emissions that would have occurred if the ICE vehicle remained in service until its natural end-of-life under the baseline scenario; and
    - the lifecycle emissions associated with the replacement zero-emission vehicle.
- Because the program causes the permanent deregistration and destruction of an operable vehicle, the resulting emission reductions are additional to those expected under normal fleet turnover and occur earlier than would otherwise be achieved.

## Additionality

- The CleanStart program generates emission reductions through a distinct causal mechanism by permanently accelerating the retirement of ICE vehicles prior to their natural end of life, thereby directly eliminating future fossil fuel use that would otherwise occur under baseline fleet turnover.

- This physical removal of vehicles from the active fleet directly eliminates future fossil fuel consumption and associated greenhouse gas emissions, complementing existing carbon-intensity reduction measures by reducing the overall demand for high-carbon transportation fuels.


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- The emission reductions achieved would be clearly and demonstrably additional to what has occurred to-date without the program based on the analysis already provided in this report.
- The CI reductions in the transportation sector would be permanent. Reductions can be evaluated as additional because, without the program, these vehicles would have continued operating until natural end-of-life and would not have been retired under any existing regulation.
- It will ensure the retirement acceleration of ICEs prior to the natural end-of-life averages.

## Permanence

- Permanent verifiable removal of ICE vehicles immediately eliminates the consumption of high-carbon-intensity fuels such as gasoline and diesel. These reductions occur independently of annual CI compliance outcomes, while remaining fully consistent with LCFS accounting and reporting requirements.

## Quantification and Verification

- The program would collect data to quantify the carbon intensity reduction achieved through the permanent removal of ICEs. The formula would include lifecycle emissions of the replacement ZEVs. Lifecycle emissions could be conservatively estimated using provincially approved electricity carbon-intensity values.
- This formula could include the:
    - validated average carbon intensity of fuels sold in B.C.
    - average fuel consumption of the ICE vehicle
    - estimate of distance travelled annually
    - carbon intensity of electricity supplied by BC Hydro
    - estimate of ZEV distance travelled annually
    - electricity energy density
    - electricity carbon intensity
- Example:

| | |
|---|---|
| 1 | • Estimate annual ICE emissions using<br>• Fuel consumption<br>• Annual distance travelled |


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| | |
|---|---|
| | • Gasoline energy density<br>• Gasoline CI |
| 2 | • Estimate replacement EV emissions using<br>• BC electricity CI<br>• EV energy consumption<br>• Annual distance travelled |
| 3 | • Calculate<br>• Annual ICE emissions<br>• Minus annual EV emissions<br>• Equals net GHG benefit<br>• Multiplied by 13.5 EV life expectancy<br>• Equals total benefit per transaction |
| | • Example with Age Range 1 Vehicle Data (Reference: *Proposed Tiered Carbon Credit Structure & Calculations.xls, Tab=Calculation Tool).* |

**Carbon Compliance Credit Calculation**

| | | |
|---|---|---|
| **Scrapped gasoline vehicle** | | |
| Fuel economy = | 13.02 | L/100km |
| Distance/year = | 10,717 | km/y |
| Gasoline energy density = | 34.69 | MJ/L |
| Gasoline carbon intensity = | 93.67 | gCO2/MJ |
| Tonnes CO2 per vehicle per year = | 4.53 | Mg CO2 |
| **New electric vehicle** | | |
| Fuel economy = | 18.4 | kWh/100km |
| Distance/year = | 16,667 | km/y |
| Electricity energy density = | 3.6 | MJ/kWh |
| Electricity carbon intensity = | 20.85 | gCO2e/MJ |
| Tonnes CO2e per vehicle per year = | 0.2302 | MgCO2e |
| **Net benefits per year per vehicle =** | 4.30 | MgCO2e |
| **Life of benefit =** | 13.5 | years |
| **Total benefit per vehicle** | 58.10 | MgCO2e |

- Where uncertainty exists, assumptions would be applied in a manner that underestimates, rather than overestimates, avoided emissions.


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- Scrap supplier vehicle receiving reports and ICBC deregistration could validate the point of compliance for credit creation. This approach aligns with existing verification practices used in prior vehicle retirement and incentive programs in B.C.
- All records would be retained in accordance with LCFS audit and verification requirements and would be available for third-party review.
- A well-defined administrative structure capable of eligibility screening, permanent vehicle retirement, rebate administration, recordkeeping, audit support, and third-party verification is already operational and available to deliver this program.

## Double-Counting

The CleanStart program would operate under a distinct crediting pathway and would include safeguards to prevent double counting with existing or previous LCFS credit generation. Each credit would be issued once, for one verified vehicle retirement, and would not be combinable with other LCFS compliance claims for the same emission reduction.

A key consideration is whether avoided fossil fuel consumption is already captured through future electricity-credit generation. CleanStart and the electricity pathways are fundamentally different activities and therefore do not claim the same emissions reduction.

The CleanStart credit source is derived from the permanent elimination of future fossil fuel demand. The electricity credit source is derived from the carbon intensity benefit of supplying electricity as a transportation fuel (in place of fossil fuel).

One credit relates to avoided fuel consumption, the other relates to fuel provision.

For example:

### BC Hydro LCFS credits used to fund the CleanBC Go Electric Rebate Program

These credits were generated from electricity supplied for ZEV charging under the BC LCFS framework. They were not generated by the purchase of the zero-emission vehicle itself.

Therefore, a ZEV that already received a rebate (as “new”) under the CleanBC program, (example: in 2023 or 2024) could now be sold as “used” and receive a CleanStart rebate because the original rebate was not based on the elimination of fuel consumption but based on credits sold from electricity supplied.


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The program would ensure no overlap with credits generated through any of the following:

- Electricity credits
- Renewable fuels
- Federal CFR compliance credits
- Any new or additional emerging pathways

### Proposed Credit Ownership and Exclusivity

- One ICE retirement = one credit claim
- Retirement records permanently linked to VIN
- No future claims permitted
- Exclusion database registry will be maintained
- If required, third-party verification can be arranged.

## Compatibility with LCFS, ZEV Act, and CleanBC

- The CleanStart program concept would work in tandem with the ZEV Act and the LCFS by providing a market-based mechanism to achieve those goals faster.
    - ZEV Act
        - The program would support demand side acceleration which is currently known to be lagging.
        - Helps to address affordability barriers that limit uptake.
        - Supports the regulation to achieve its goal with respect to ZEV sales targets for automakers and supports compliance.
        - Inherently supports/requires the expansion of charging infrastructure (increases demand).
    - LCFS
        - The program provides a carbon-aligned compliance option for regulated fuel suppliers as compliance becomes increasingly more difficult.
        - Reduces the number of ICE vehicles on the road so the regulation is not continuously fighting against a larger pool of consumption.
        - Reduces dependence on (speculative) future ZEV uptake which is currently stated to be lagging.
        - Improves ZEV sales uptake on which the LCFS performance relies.
        - Encourages electricity use as a low-carbon fuel and supports the need for increased low-carbon fuel supply (e.g. ZEV charging).
    - CleanBC


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- The initiative would clearly align with CleanBC targets, LCFS compliance flexibility, and equity/affordability commitments.

## Comparison to Existing BC Initiative Agreement Pathways

The CleanStart Program builds upon principles already recognized within B.C.'s LCFR framework, while addressing an emissions-reduction opportunity not directly captured by existing transportation fuel pathways. The program would complement, rather than replace or duplicate, existing LCFS credit-generation mechanisms.

- Existing pathways = fuel-side solution.
- CleanStart = demand-side solution.

### Existing Initiative Agreement Framework

Initiative Agreements have recognized innovative activities that produce measurable, verifiable, and additional GHG reductions beyond standard LCFS compliance pathways.

As we understand it, these agreements provide a mechanism to evaluate new approaches on a case-by-case basis where the activity contributes to transportation-sector decarbonization and aligns with the objectives of the regulation.

### Comparison with Existing LCFS Credit Pathways

| **Electricity Pathways** | **CleanStart** | **Key Difference** |
|---|---|---|
| Electricity pathways generate credits based on the supply of electricity as a transportation fuel. Credits are created when electricity displaces higher-carbon transportation fuels (fuel switching) and are quantified using approved carbon-intensity values. | CleanStart does not generate credits from electricity supplied or consumed. Instead, credits are generated through the permanent elimination of future gasoline or diesel consumption that would otherwise occur if the vehicle remained in service until its natural end-of-life. | Electricity pathways credit lower-carbon fuel supply. CleanStart credits permanent elimination of future fuel demand. |


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| Renewable Fuel Pathways | CleanStart | Key Difference |
|---|---|---|
| Renewable diesel, renewable gasoline and other approved fuels generate credits based on the lower carbon intensity compared with conventional fuels. Existing vehicles remain in operation and continue consuming the renewable fuel. | The CleanStart Program will permanently remove vehicles from the fleet completely, rather than reduce the carbon intensity of fuels consumed by those vehicles. Fuel consumption is eliminated rather than modified. | Renewable fuel pathways reduce the carbon intensity of each litre consumed; CleanStart reduces the total number of litres consumed. |

| Hydrogen Pathway | CleanStart | Key Difference |
|---|---|---|
| Hydrogen pathways generate credits through the supply and use of hydrogen as a transportation fuel. The emissions benefit is created through replacement of conventional fuels with a lower-carbon transportation energy source. | CleanStart generates reductions through accelerated retirement of internal combustion vehicles and the elimination of future fossil fuel consumption. Emission reductions occur at the point the vehicle is permanently removed from service. | Hydrogen pathways achieve reductions through fuel substitution. CleanStart achieves reductions through permanent source elimination and accelerated fleet turnover. |

| Existing Programs | CleanStart | Key Difference |
|---|---|---|
| Existing ZEV incentive programs primarily encourage adoption of cleaner vehicles. | CleanStart requires retirement and destruction of an existing ICE vehicle as a condition of participation. | Existing programs add cleaner vehicles to the fleet. CleanStart simultaneously adds cleaner vehicles and |


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| | | |
|---|---|---|
| | | removes higher-emitting vehicles from the fleet. |

Existing LCFS pathways primarily reduce the carbon intensity of transportation fuels. CleanStart reduces demand for higher-carbon-intensity transportation fuels by permanently removing internal combustion engine (ICE) vehicles from the fleet.

## California Comparison

Evidence that regulators recognize early ICE retirement as a legitimate emissions-reduction mechanism.

California is currently operating two programs which feature “scrap-and-replace” characteristics. These programs:

Are live precedents (not legacy or ended programs)

- Utilize regulator-approved vehicle retirement methodologies.
- Are credit-funded and have an equity-focused design:
    - CC4A is 85-95% funded via Cap-and-Trade program auction proceeds with other minor sources coming from Air Districts or In-kind participation.
    - DCAP is 70-90% funding via Cap-and-Trade program auction proceeds with the remainder coming from the California General fund and other minor financial instruments.
- Present a clear demonstration of distinct causal mechanism (early ICE retirement).

California Air Resources Board (CARB) programs support vehicle retirement. Both California programs, Clean Cars 4 All (CC4A) and the Driving Clean Assistance Program (DCAP) support the retirement of internal combustion engine (ICE) vehicles. They:

- Provide financial incentives that are conditional on scrappage.
- require the permanent retirement of an existing ICE vehicle as a condition of receiving incentives toward a zero-emission vehicle (ZEV), plug-in hybrid, transit credits, or other clean mobility options.
- demonstrate that vehicles are operable, deregistered, and dismantled through approved channels, ensuring permanence; and,
- accelerate early retirement.

These programs target vehicles that would otherwise remain on the road for years,


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creating additional emissions reductions beyond natural fleet turnover. By tying incentives to removal of ICE vehicles, the programs eliminate future gasoline or diesel use from those vehicles and replace mobility needs with electricity-based transportation (ZEVs).

### Notable features of California's programs

- Under California's LCFS and complementary CARB programs, agencies approved crediting structures where high-emitting ICE vehicles were permanently retired and replacement vehicles were ZEVs, BEVs, or very low-emission vehicles.
- Credits were issued based on avoided future fossil-fuel use, not instantaneous fuel substitution.
- Largely funded by California's Cap-and-Trade auction proceeds.
- Credits are not tied to electricity supplied to the ZEV. Electricity continues to generate separate LCFS credits when reported as transportation fuel.

## Conclusion

We respectfully request the Ministry of Energy Mines and Low Carbon Innovation give thoughtful consideration to supporting CleanStart Program as a complementary credit-generation initiative. Through this approach, revenue could be reinvested to support early retirement of internal combustion engine (ICE) vehicles and adoption of new and used ZEVs.

With over 29 years of experience managing vehicle retirement and many other clean transportation programs totalling over $92 million in rebates issued in B.C., EcoForward is a "ready to go" solution. The administrative infrastructure is already in place, so program implementation could occur rapidly following approval.


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