Enabling choice in a monopolistic retail electricity market

Boosting flexibility in the Swiss retail electricity market

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Preview

We start by showing

- lessons from the last energy crisis
- why hedging is a good thing
- current situation in Switzerland

We present

- a mechanism to enable device specific suppliers in a monopoly context
- compensation payments as a tool

To achieve

- a policy setting that combines the advantages of a monopoly (stable electricity costs) with the advantages of competition (business models to tap demand flexibility)

Motivation (lessons learnt from the crisis)

The Good

- Swiss Customers were well-protected from price hikes (because there is no electricity retail competition and prices are regulated)

The Bad

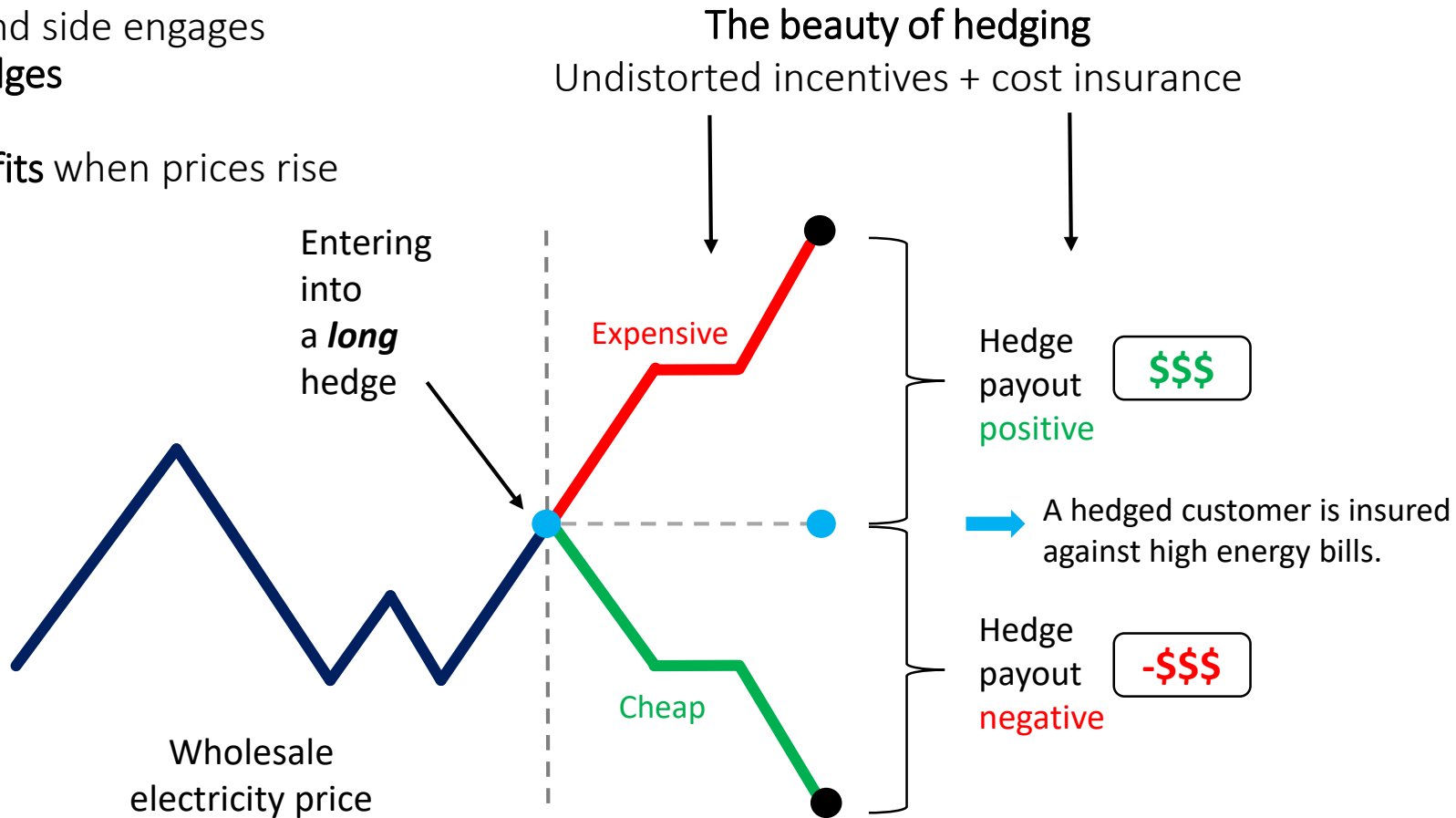- Retail prices did not give energy savings incentives

The Ugly

- Monopolists have little incentives to harness flexible demand assets like heat-pumps and EVs

Why hedging is a good thing?

The demand side engages
in *long* hedges

Long benefits when prices rise

The beauty of hedging
Undistorted incentives + cost insurance

Entering
into
a **long**
hedge

Expensive

Cheap

Wholesale
electricity price

Hedge
payout
positive

$$$

A hedged customer is insured
against high energy bills.

Hedge
payout
negative

-$$$

"Balancing pooling" model in Switzerland is insufficient

Aggregators can only do "balancing pooling" currently in Switzerland
- Limited and problematic

Balancing market is small
- Balancing pooling addresses a niche market (2,5% of the energy market)
- The big money is in energy markets: Forward, DA, ID

Problems of multiple concurrent suppliers
- Concurrent supplier arrangements are often complex
- The operation of an asset affects its interactions with several markets
- Suppliers adversely impact each other in managing one asset

Thus: One device, one supplier
- Clearly separating by device allows value creating along the full value chain

Allowing e-cars and heat pumps market access

Naïve solution: Allowing e-cars and heat pumps market access
- This is problematic

Cherry picking
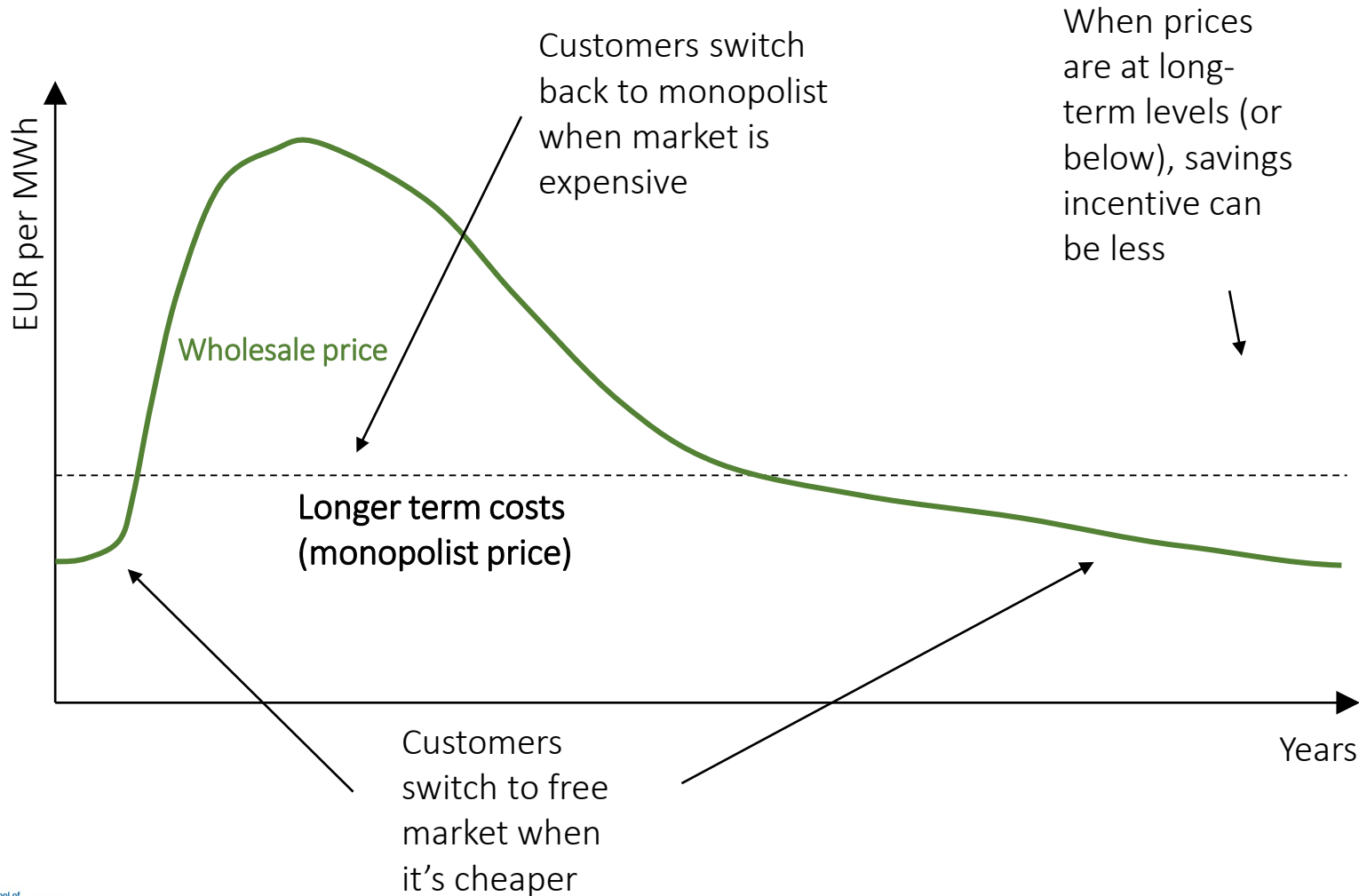- Switch to market in cheap times
- Switch to "safe harbor" in crisis times

Adversely affects hedged positions
- The monopolist cannot hedge for the full volume
- Because some of that volume might escape when the market is cheaper

Reduces flexibility during crises
- When flexibility (energy saving) is needed the most (during crisis), it will not be available (because in crisis everyone goes to the safe harbor)

Switching incentives: Cherry picking

Customers switch back to monopolist when market is expensive

When prices are at long-term levels (or below), savings incentive can be less

EUR per MWh

Wholesale price

Longer term costs (monopolist price)

Years

Customers switch to free market when it's cheaper

Solution: Price-level compensation

What is it?

- Lump sum payments between monopolist and new supplier
- Fixed monthly payments for the duration of a (e.g. a 2-year) contract
- Enable new suppliers to participate in the monopolist's hedge for the duration of the consumer's contract
- Like risk compensation of health insurances ("back-end transactions")

Can go both ways

- high price times: payment from monopolist to new supplier
- low price times: payment from new supplier to monopolist

Who gets/pays the money?

- The new supplier recovers the money from the customer in monthly installments
- As pre-payments in high-price times or fixed monthly fees in low-price times

Where does the money come from?

Why does the monopolist pay the new supplier in times of high prices?

- In the past, the monopolist *had already hedged* the energy the consumer would use (because in a monopoly, customers cannot run away)

- Assume a customer switches **away from the monopolist** to a new supplier during a **high-price** period, the monopolist has too much hedged energy (which he had hedged at a lower price – and thus makes a profit from selling that energy on the spot markets)

- Thus, the compensation **payments** we propose **transfers the monopolist's windfall profit** to the new supplier

…and the other way around in low-price times (payment from new supplier to m.)

- Here, a monopolist makes a loss on his hedge when customers switch away (because he can sell the hedged energy only at a loss to spot markets)

- Thus, he needs a compensation if customers switch away
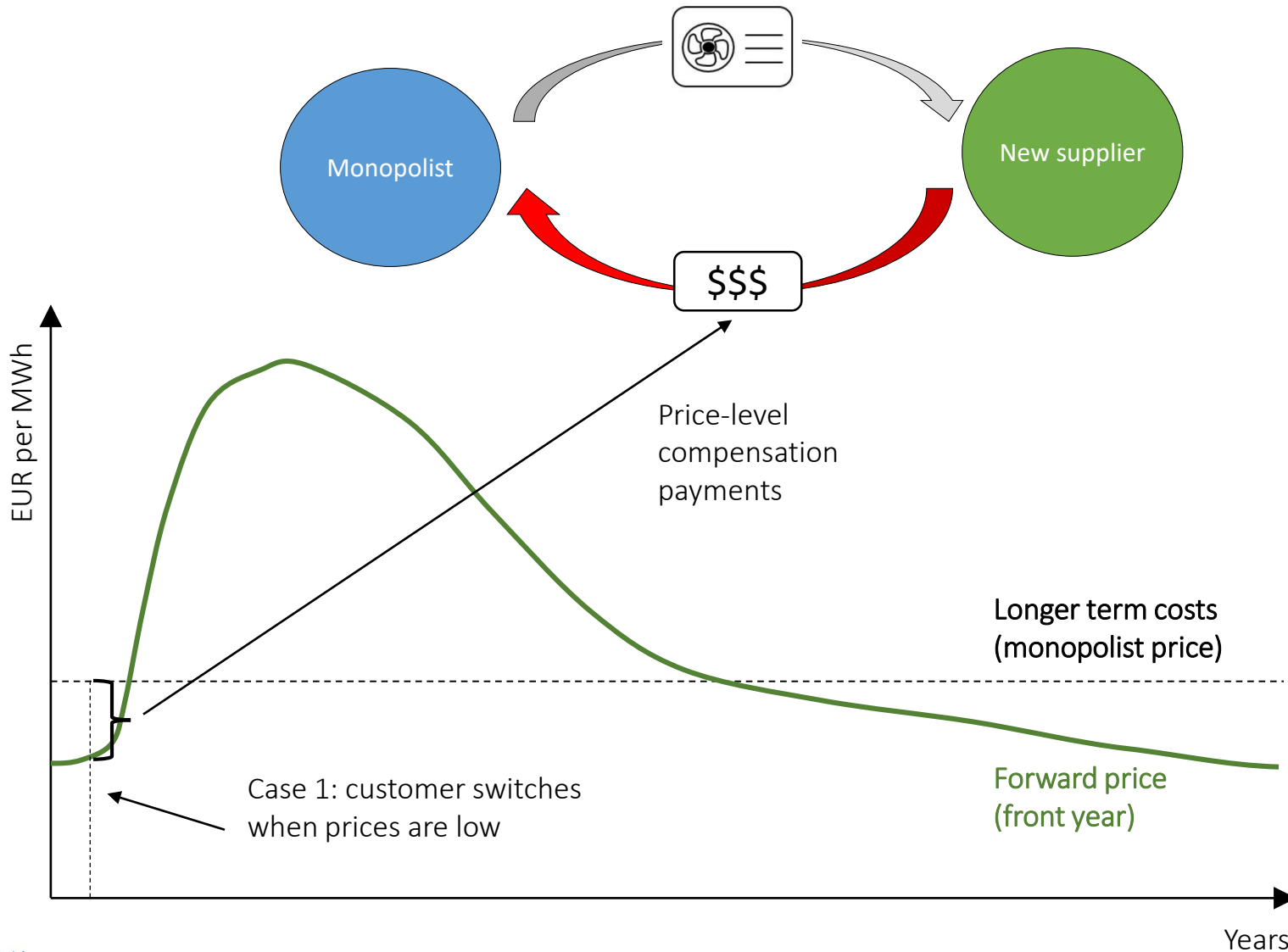
Parameters

Two important parameters: Volume and price

- Volume: For which amount of energy is the compensation payment due?
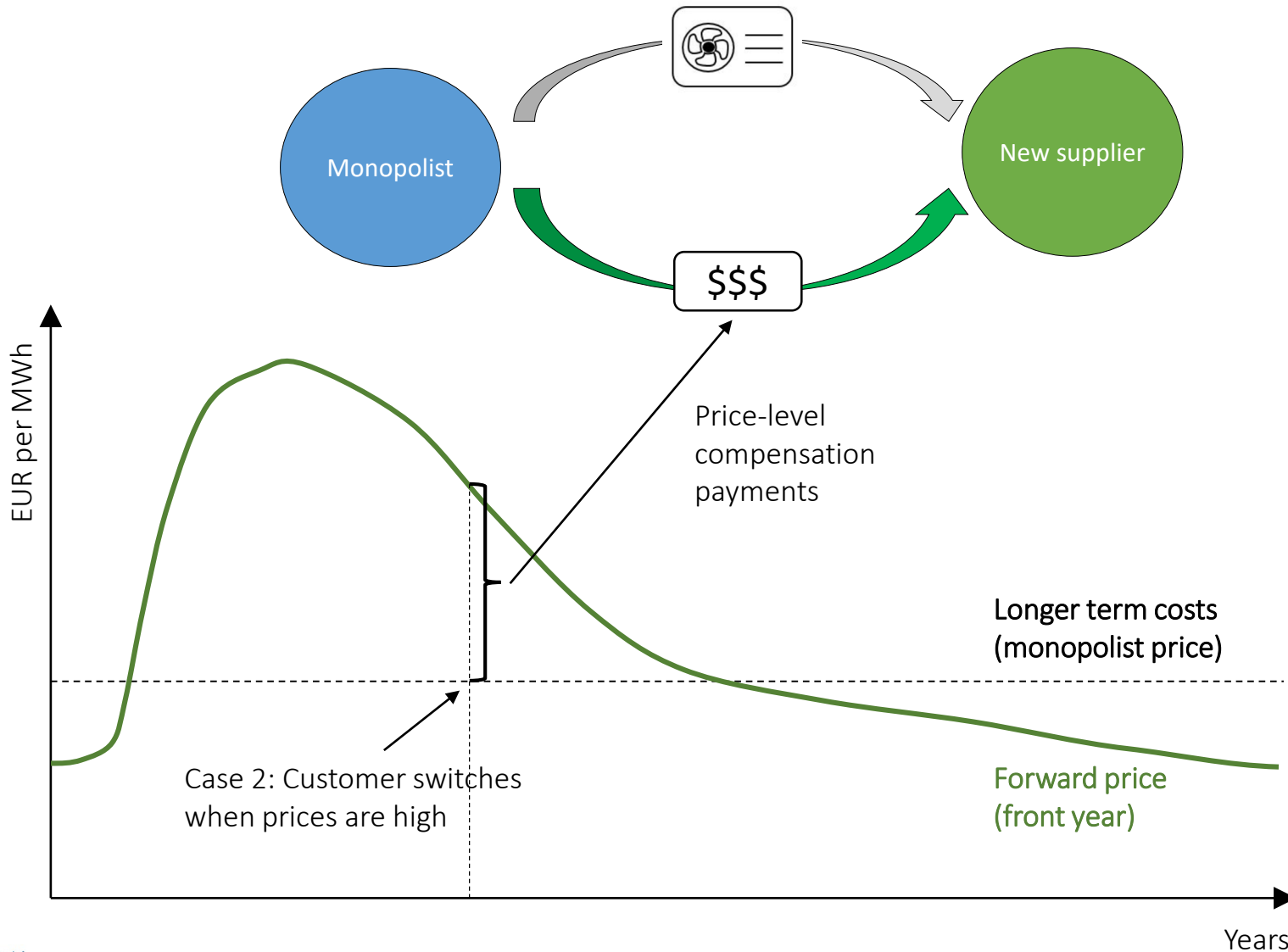- Price: What's the per kWh price to be compensated

Price: the difference between...

- forward prices for the contract period at time of contracting and
- regulated rates (only energy component) of the utility towards its customers

Compensation payments: Switch example during low-price

Compensation payments: Switch example during crisis

Monopolist

New supplier

$$$

Price-level
compensation
payments

EUR per MWh

Longer term costs
(monopolist price)

Forward price
(front year)

Case 2: Customer switches
when prices are high

Years

Volume: How much energy to compensate for?

Criteria

- Should not be influenced by actual consumption
  (→ for energy saving incentives)
- But: Be a good fit / proxy to actual consumption
  (→ to avoid systematic switching incentives)

Volume: Different options

- Binary "per heat-pump" or "per EV" payment
- Last year's volume
- Ex-post actual volume

Conclusion

"Light-version" of full market opening

- Enables free choice only for heat-pumps and EVs
- While avoiding the systematic cherry-picking incentives

Device suppliers

- Could be a way to increase valorization of flexibility in Switzerland

Next steps

- Further analyze the different options to calculate compensation payments

Device suppliers in a monopoly context

Back-up slides

# Electricity cost stability: Monopoly vs. retail

Swiss electricity prices increased rather moderately

- Swiss tariffs remained more stable than Germany's (CH +5.8 Rp to 26.95 Rp./kWh for 2023)
- Some utilities hedge longer than others (own generation assets)

Die Strompreise in den Schweizer Gemeinden 2023
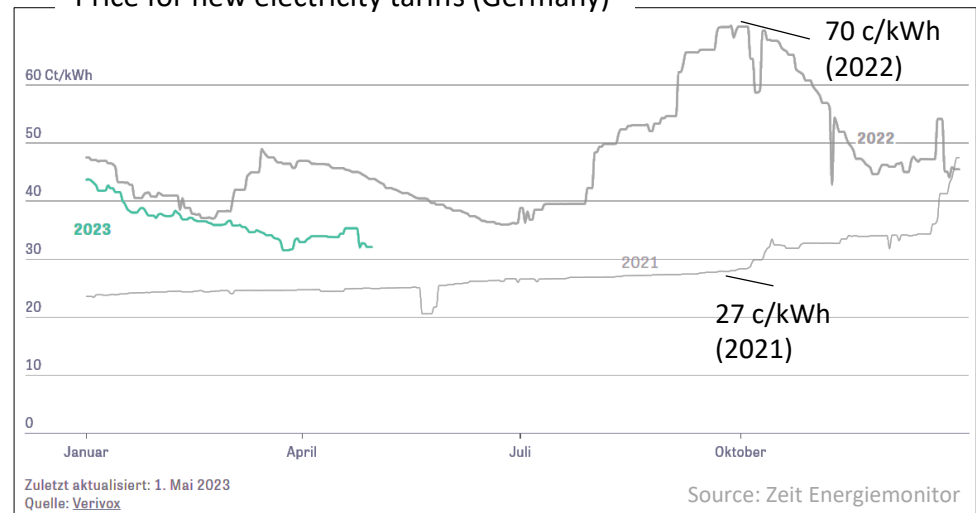Wohnung mit einem jährlichen Verbrauch von 4500 kWh*

Preis in Rappen pro Kilowattstunde
8   60
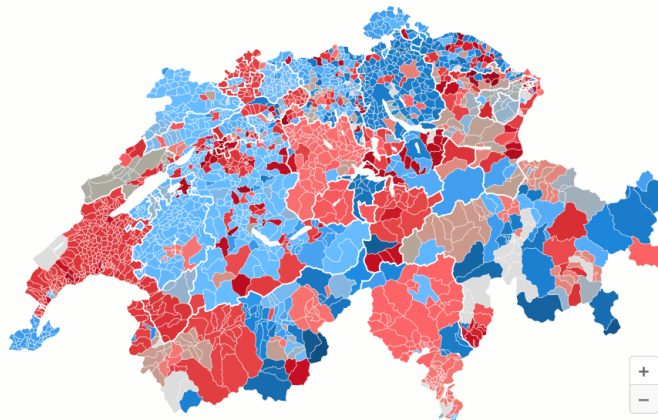
*5-Zi.-Wohnung mit Elektroherd und Tumbler ohne Elektroboiler. Für Gemeinden mit mehreren Netzbetreibern ist der Durchschnittspreis ausgewiesen.
Quelle: Elcom • Kartenmaterial: Bundesamt für Statistik (BFS), GEOSTAT

Price for new electricity tariffs (Germany)

70 c/kWh (2022)

27 c/kWh (2021)

Zuletzt aktualisiert: 1. Mai 2023
Quelle: Verivox

Source: Zeit Energiemonitor

No price signals for consumers

Monopolist retailers kill the price signal

- Wholesale prices don't propagate to retail prices (or to a very limited extent only)

Demand response is beneficial both societally and individually:

1. It makes <u>individual</u> electricity use cheaper ("there's money on the table")
2. It makes the <u>system</u> more reliable, less resource-intensive and cheaper

Protection from high energy costs

Retail monopoly protected Swiss citizens from high electricity prices in crisis

- Massive <u>wholesale</u> price increases
    - +425% for CH for Q3 year-on-year
- Consumers' <u>retail</u> rates remained rather stable in CH
    - CH +5.8 Rp to 26.95 Rp./kWh for 2023 (70 c/kWh in Germany)

Long-term hedges

- Most utilities hedge long-term
- Own generation assets; longer term forward contracts, etc.
    - Their customer base is stable – unlike in competitive markets

Put simply: The retail monopoly is good for electricity cost stability

Little incentive to change

In Switzerland, there is no retail competition

- …and it's unlikely to materialize in the next 5 years

Monopolist retailers are ill-positioned to harness flexibility

- For two reasons
    1. Lacking incentives
        - When prices are regulated, incentives are lower
    2. Information asymmetry
        - Swiss-wide flexibility suppliers can reap economies of scale
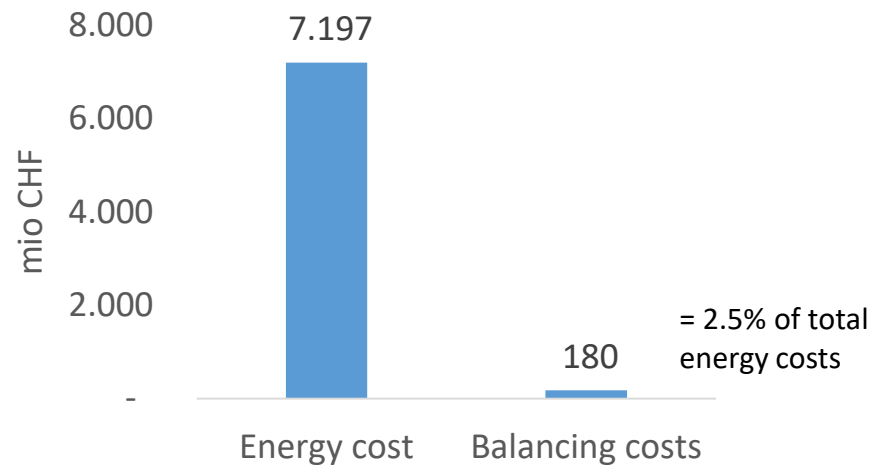
Wholesale energy is big, balancing small

Aggregation should target energy

- It is the big market

Balancing is a niche

- Market volume has declined till 2020
- It is only **2.5% of the energy market**
- Not very relevant in overall perspective

Wholesale energy costs vs. balancing costs (2021)

mio CHF

7.197	
Energy cost	Balancing costs
	180

= 2.5% of total energy costs

Own calculations, based on Elcom (2022), BFE (2022)

Incentives from prices

Demand reactions can take different forms

1. **Energy saving**: Save more energy in an energy crisis ("price level effect")
2. **Demand shifting**: Time your demand to low-price periods ("price structure effect")
3. **Re-scheduling of demand**: (Re-)plan when to consume ("trading time effect")

First best

- …is when all demand reactions are fully incentivized (none muted)

Motivation (summarized)

The Good

- Swiss Customers are well-protected from price hikes
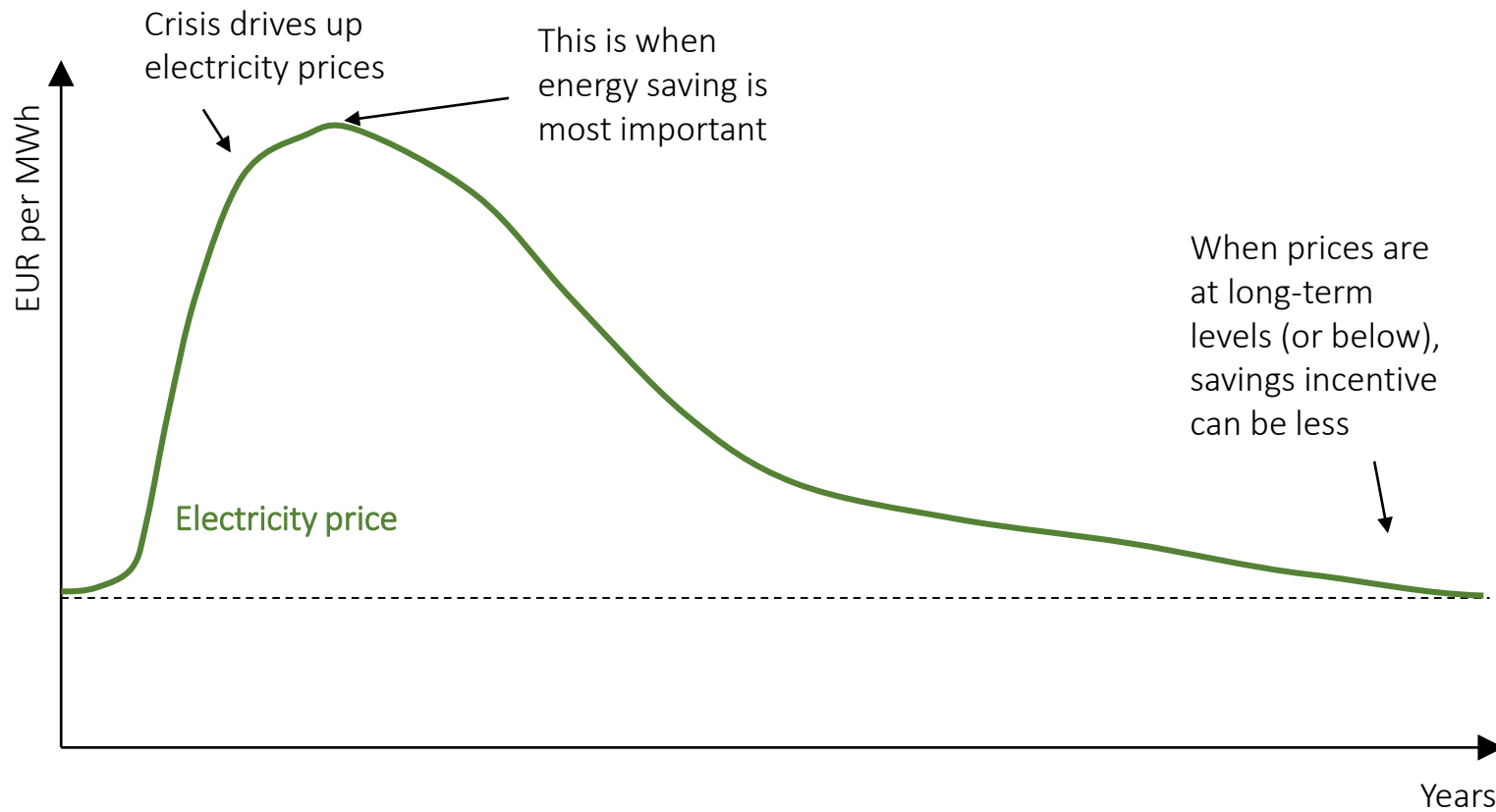
→ Keep the long-term hedge

The Bad

- Prices did not give energy savings incentives

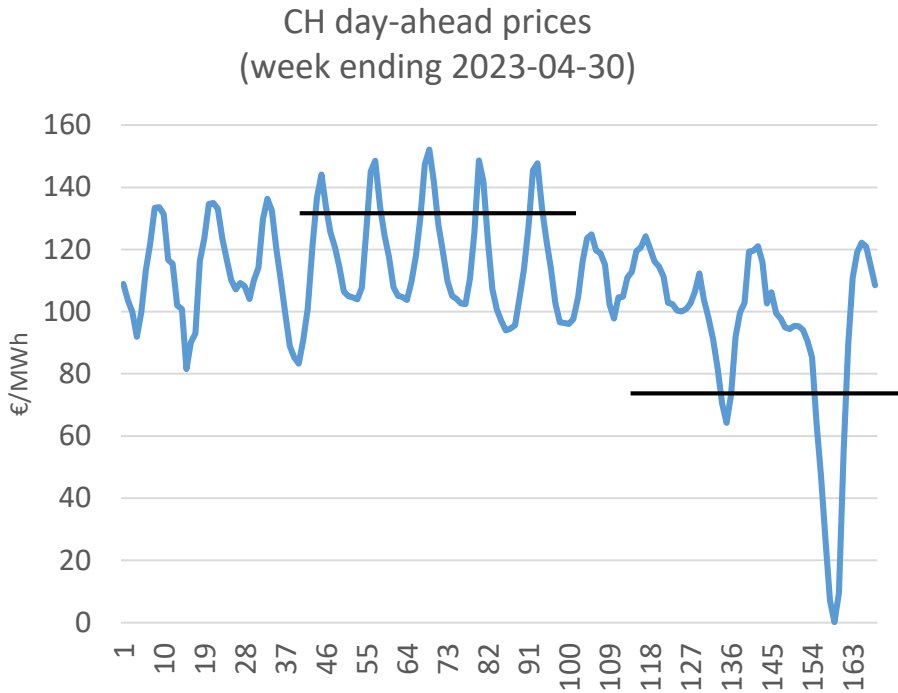→ Consumers are not exposed to wholesale prices (level, structure, trading time)

The Ugly

- Monopolists are slow when it comes to incentivizing demand-side response

→ Prevents the entrance of new actors (aggregators, competitive suppliers) and hinders innovation

Energy saving incentives (price level effect)

Crisis drives up electricity prices

This is when energy saving is most important

When prices are at long-term levels (or below), savings incentive can be less

EUR per MWh

Electricity price

Years

Demand shifting (price structure effect)
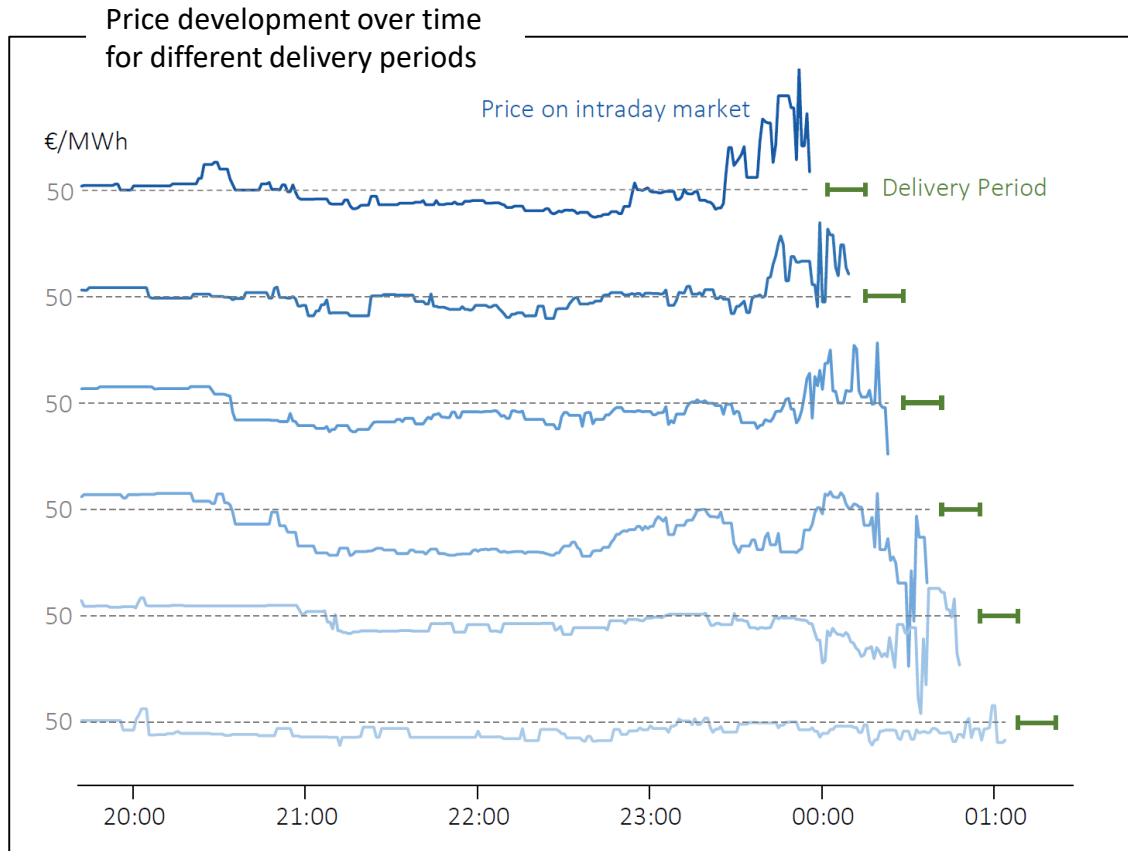
CH day-ahead prices
(week ending 2023-04-30)

Consumers

- Benefit from low prices (individual)

- Help alleviate price spikes (system)

Re-scheduling of demand (trading time effect)

Price development over time
for different delivery periods

€/MWh

Price on intraday market

Delivery Period

50

50

50

50

50

50

20:00   21:00   22:00   23:00   00:00   01:00

Source: Neon (2021)

- Consumers can lock in cheapest hours early

- And then re-optimize once cheap hours change

- Even in real-time they can re-schedule

- Most of this will happen automatically in the background

- Helps the system cope with unforeseen situations

- "Option value"

Device-specific suppliers

Can unlock more flexibility than monopolist utilities

- Specialization : Better knowledge of device capabilities
- Enables better flexibility provision
- Flexibility management can be integrated into device's user interface (e.g. tell your car when you want it fully charged)
- Device-specific suppliers (heat pump provider, e-car OEM) can access more specific device features

But: Vender lock-in

- Asset producer companies could make it hard for competitors to access hardware
- → Standards needed for charge management / building energy management

Competition drives innovation

Disallow switching back?

Dis-allowing switching back is also problematic

1. Consumers start switching to the market only in times of low market prices
2. Some risk-averse consumers might refrain only due to irreversibility
3. Such regulation might be unstable (see example below)

Example: Pressure to re-open safe-harbor in crisis times

- Those who opted for the market in the past, wished themselves back in crisis

- In the end, the lobbying was not successful, but it was a close call

- This highlights the political instability of such rules

Tabubruch von Guy Parmelin: Firmen sollen auf Kosten der Haushalte profitieren

Der Wirtschaftsminister will Unternehmen, die am Strommarkt leiden, eine Rückkehr in die Grundversorgung ermöglichen. Für Private könnte das spürbare Folgen haben.

Stefan Häne , Fabian Renz
Publiziert: 25.10.2022, 05:47   281

Solution: Price-level compensation

Fix the cherry-picking

- Introduce payments between monopolist and new supplier

Compensation payments for the price level effect

- Payments between monopolist and the new suppliers
- Like risk compensation of health insurances ("back-end transactions")
- Force/enable aggregators to participate in the monopolist's hedge for the duration of the consumer's contract

(1) Binary "per-heat pump" or "per EV" payment

- Based on average consumption of the device type
- Is highly independent, thus provides full energy saving incentives (payment does not increase/decrease based on actual consumption)
- Adverse selection: In a crisis, only those who drive less than average would move
- Puts the monopolist in a bad situation (aggregator is fine)

Backend-transactions: Options for volume (2/3)

(2) Last year's volume

- Cannot be influenced any more
- But this year is next year's last year $\rightarrow$ impacts this year's expected per kWh price

Backend-transactions: Options for volume (3/3)

(3) Ex-post actual volume

- Kills energy saving incentives during high-price crises
- But: solves the difficult question of how to determine volume
- Retains within-year flexibility (consumption timing) incentives