1ST YEAR VS. LIFETIME SAVINGS GOALS
MINNESOTA WEBINAR

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Energy Futures Group Consulting

Expertise

- Efficiency
- Renewables
- Electrification
- Building Codes

Services

- Policy Devt
- Program Design
- Evaluation
- Cost-Effectiveness
- Testimony

Range of Clients

- Govt Agencies
- Advocates
- Regulators
- Utilities

Clients in 30+ states, 5 Canadian provinces, Europe & China

Presentation Overview

1. Pros and Cons of 1st year Savings Goals
2. Alternatives to 1st Year Savings Goals
3. IL's Cumulative Persisting Annual Savings Goals

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1st Year Savings Goals

1st Year Savings Goals: Pros & Cons

Pros

- Easy to understand
  - annual savings as % of sales
- Easy to benchmark
  - everyone reports it
  - that's why it is the basis for ACEEE scorecards

Cons

- Doesn't account for savings longevity
  - no relationship to $ value of savings
  - no relevance to system planning/IRP needs
- Perverse incentives to pursue short-lived savings
  - Many short-lived savings are cheap on $/1st year kWh basis…
  - …but expensive on $/lifetime kWh basis

Perverse Incentives

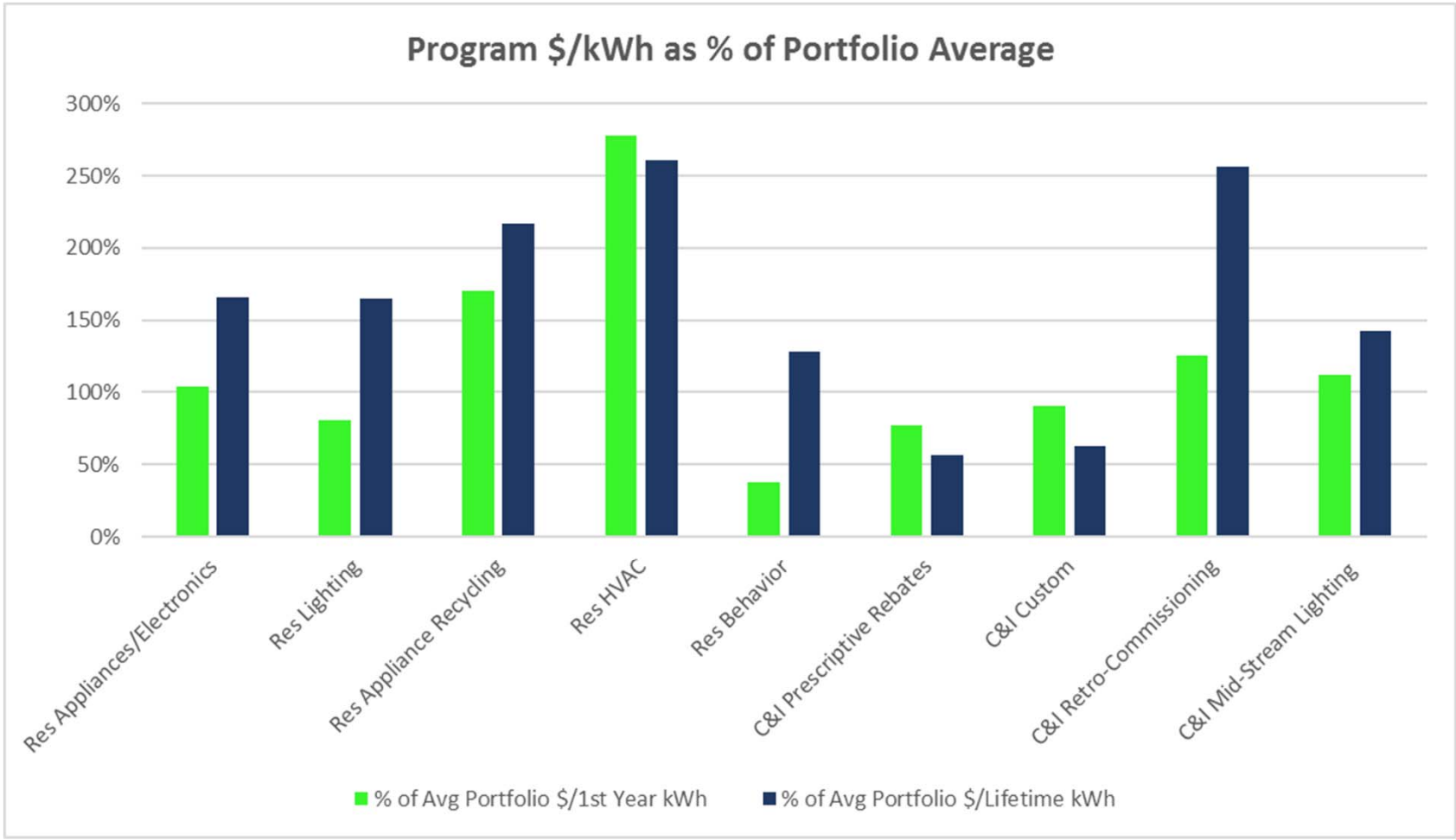
Hypothetical Example:

	Savings/ Year	Measure Life	Cost	Cost/unit of 1st year savings	Cost/unit of lifetime savings
Measure 1	20 therms	1	$10	$0.50	$0.50
Measure 2	100 therms	20	$200	$2.00	$0.10

Implications for EE Prioritization

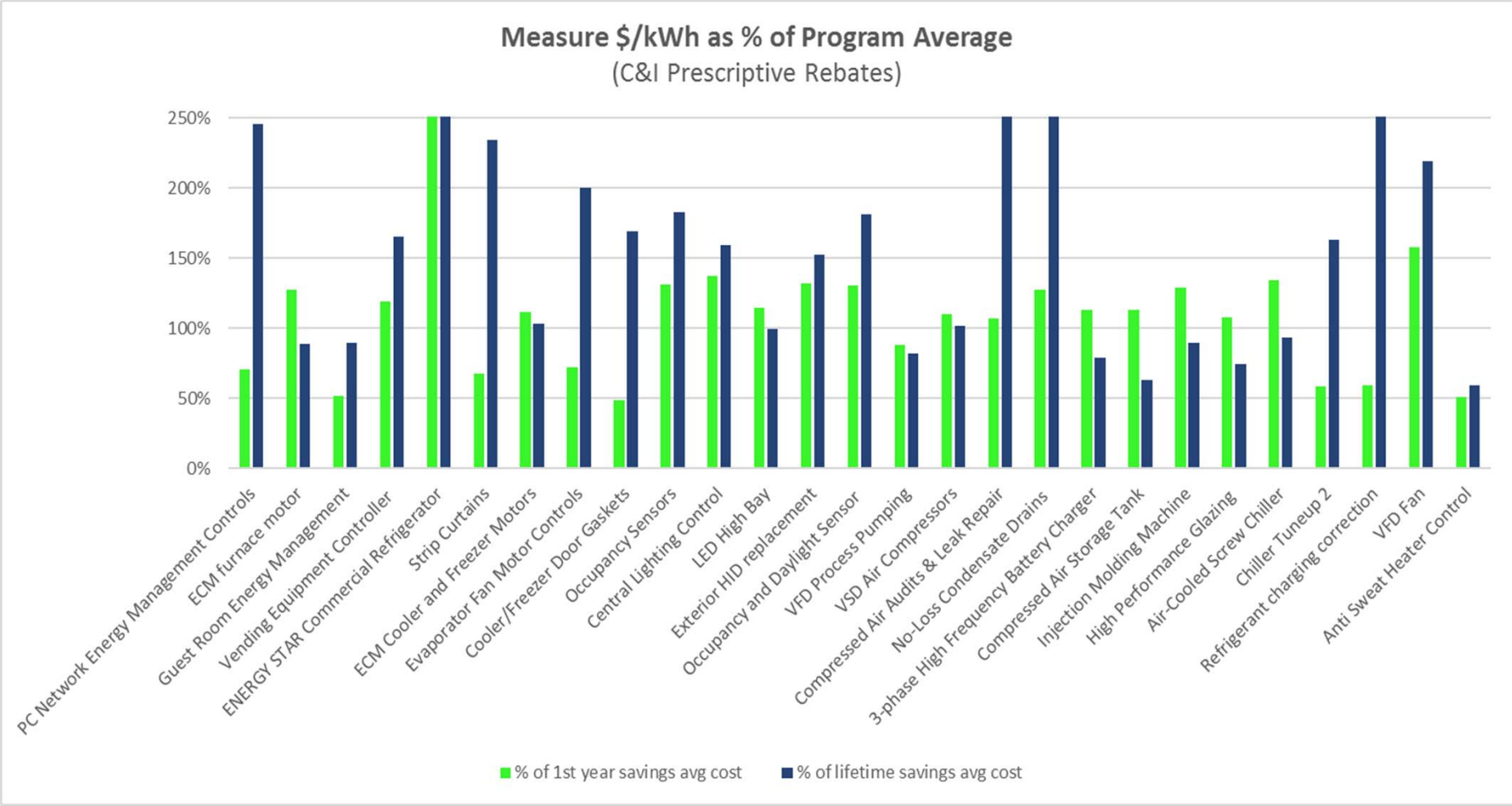
- Affects *program* emphasis within portfolio
  - Residential Behavior most obvious example
  - But definitely not the only one
- Affects *measure* emphasis within programs

Implications for Program Choice/Emphasis



2018 Midwest utility plan, with my adjustments to savings life for Res Behavior (increased to 3 years), LED lamps governed by EISA (decreased to 4 years) & C&I retro-commissioning (increased to 5 years). Portfolio includes three programs not shown that all have costs >300% of portfolio average both ways (low income, multi-family retrofit, single family retrofit).

Implication for Measure Choice/Emphasis



Partial list of 100+ measures from 2018 Midwest utility program plan. Measures selected to show range of impacts – not necessarily representative of variation across all measures in program. Most values shown at 250% are much higher (cut off to make viewing easier).

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Alternatives to 1st Year Savings

Range of Options

1. 1st year savings + short-lived measure limits
2. 1st year savings + bonus for long-lived measures
3. 1st year savings + avg. measure life adjustment factor
4. Lifetime savings
5. Discounted lifetime savings
6. NPV of net benefits
7. Cumulative persisting annual savings

1st Year Savings + Short-Lived Measure Limits

- Pros:
  - Preserves easy-to-understand 1st year savings goals
  - Curbs excessive promotion of short-lived savings
- Cons:
  - Arbitrary (3 years? 5 years? Other?)
  - Blunt instrument
    - Treats all measure lives above/below cut-off as equal
  - Reduces portfolio flexibility

Used in several European countries

1st Year Savings + Long-Lived Measure Bonus

- Pros:
  - Promotes longer-lived measures
- Cons:
  - Arbitrary (10 years? 15 years? Other?)
  - Blunt instrument
    - Treats all measure lives above/below cut-off as equal
  - Distorts meaning of 1st year savings values
  - Much of bonus may go to measures that would have been promoted anyway

Used in MI utilities' shareholder incentive mechanism several years ago

1st Year Savings + Avg Measure Life Adjustment

- Pros:
  - Preserves easy-to-understand 1st year savings goal
  - Assigns equal value to all measure life increments
    - Advantage vs. arbitrary cut-offs for limits/bonuses/penalties
- Cons:
  - Effectively values future savings same as current savings
    - May or may not be equally valuable to system

Functionally same as lifetime savings, just expressed differently

No known examples

Lifetime Savings

- Pros:
  - Conceptually easy to explain/understand
  - Assigns equal value to all measure life increments
    - Advantage vs. arbitrary cut-offs for limits/bonuses/penalties
- Cons:
  - Effectively values future savings same as current savings
    - May or may not be equally valuable to system
  - Harder to put goals in context (e.g. relative to annual sales)

Used in WI, MI (shareholder incentives mechanism), & Ontario (gas)

Discounted Lifetime Savings

- Pros:
  - Values all savings over life of measures…
  - …but treats near-term savings as more valuable
  - Could be better reflection of economic value
    - Depends on avoided costs and how they change over time
- Cons:
  - More complex to compute and communicate
  - Potential for reduced transparency
    - If same discount rate not used across all utilities
    - If discount rate changes over time

No known examples

NPV of Net Benefits

- Pros:
  - Values all savings over life of measures
  - Goals nominally expressed in terms of their actual value
- Cons:
  - Much more complex
    - Difficult to set appropriately challenging goals
  - Key variables – avoided costs – often differ between utilities
    - Impossible to establish goals in uniform way
    - difficult to compare effectiveness of performance across service areas
  - Key variables – avoided costs – often change
    - Impossible to maintain consistency in goals over time

No known examples of goals set this way

But many states have performance incentives tied to NPV net benefits

Cumulative Persisting Annual Savings

- Pros:
  - Only approach that directly aligns with system planning
  - Inherently adds value to longer-lived measures
- Cons:
  - Must set goals many years into future to be effective
  - Does not distinguish between different lives for measures still producing savings in last year for which goals set
    - Increasingly bigger issue the closer you get to last year

New system in IL; also approach in European Union EE Directive

Illinois' Cumulative Persisting Goals

Savings Target Defined Differently

The Old Targets:

- Incremental annual savings as % of sales
  - New annual savings was all that mattered
  - 1-year measures counted just as much as 10-year measures
  - Savings from measures installed previous years irrelevant

The New Targets:

- Cumulative persisting annual savings (CPAS) as % of sales
  - Counts all annual savings from measures installed since 2012 that have not reached the end of their useful life
  - Persisting savings from 2012-2017 measures are deemed
  - Will need to track persisting savings for 2018 and beyond

CPAS Formula

(Cumulative Persisting Savings from Measures installed since 2012)

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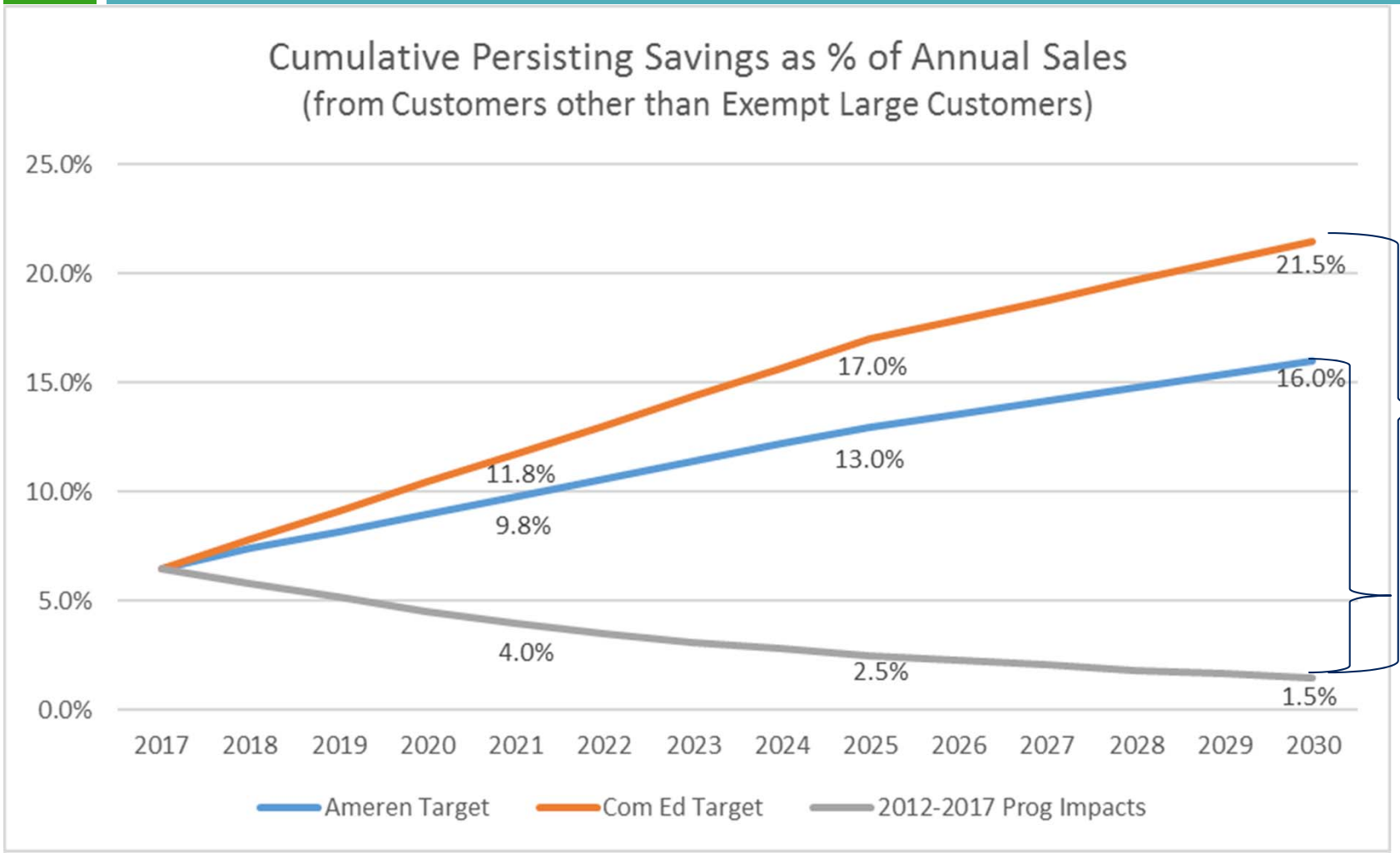
(Avg Annual Sales 2014 thru 2016 from Customers other than Exempt Large Customers)

New Savings Targets



ComEd 2018-2021 Plan

	2018	2019	2020	2021
ComEd Target	**7.8%**	**9.1%**	**10.4%**	**11.8%**
Savings Persisting from 2012-2017 Programs	5.8%	5.2%	4.5%	4.0%
Savings Persisting from 2018 Programs	**2.2%**	2.1%	2.0%	1.8%
Savings Persisting from 2019 Programs		**2.1%**	2.0%	1.9%
Savings Persisting from 2020 Programs			**2.1%**	2.0%
Savings Persisting from 2021 Programs				**2.1%**
Total Savings that Count Towards Target	**8.0%**	**9.4%**	**10.6%**	**11.8%**

Key challenges with savings "die off":

- Continuous die-off of Res. Behavior savings
- EISA 2020 standards create savings "cliff" for light bulbs installed in *all* years
- SEM savings life of 3 years means all 2018 SEM savings need replacing in 2021

Utility Performance Incentives

- EE spending is rate-based
- Utility rate of return tied to goal achievement
  - Up to 200 basis point bonus for 25% above goal
  - Up to 200 basis point penalty for 25% below goal for Com Ed
  - No Ameren penalty unless below 85% of goal

Effects of Goals Based on CPAS

- **Increased average measure life:**
  - ComEd: 11-12 years in current plan vs ~8-9 years in previous years
- Less emphasis on residential behavior programs
  - ComEd: moderate savings reduction vs. past plans
  - Ameren: very large savings reduction, rotating cohorts
- Residential Lighting
  - ComEd: elimination of all standard LED promotions after 2018
- 2021 created special challenges
  - EISA lighting savings "cliff" affecting any light bulb installed from 2018 on
  - 2018 SEM program savings die-off (due to measure life of 3 years)
- Increased focus on measures lives in TRM update/evaluation work
- Increased focus on savings life in R&D, 3rd party prog procurement

Q&A

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