



# Economics Society of Calgary

## Introduction to Financial Transactions in the Natural Gas Market

Thursday November 30, 2000

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# Unveiling the Mystique of Financial Transactions

- Concept of Risk Management
- Participants and their Roles
- Tools Available for Use
  - Futures
  - Swaps
  - Options
  - Derivatives
- Real Life Examples



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# Risk Management

Risk Management means different things to different people

- “the chance of loss to the subject matter that is unexpected or undesired”
- Risk of a revenue generating asset breaking and thus not being able to produce products (Plant, Pipeline, “Acts of God”).
- Risk of a change in the financial value of a commodity that is Owned or Owed.

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# Risk Management

Risk Management means different things to different people

- Some companies want to reduce risk while others are willing to accept risk
- Risk is transferred for one party to another for a price
- Hedgers look to eliminate risk
- Speculators warehouse risk

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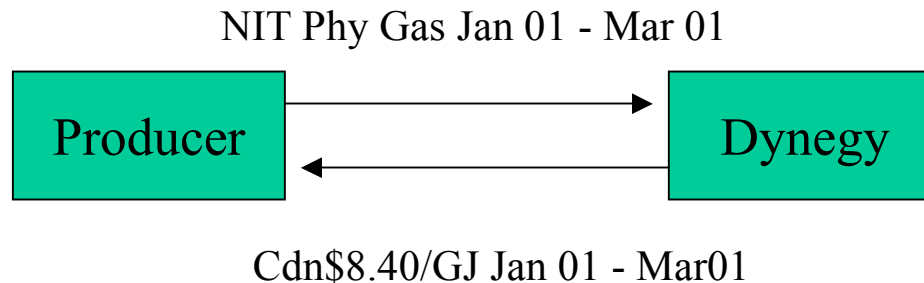
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# Participants and their Roles

## Hedging vs. Speculation

- Hedging: A set of completed transactions that result in NO unknown variables.
  - A producer that has a known production rate and chooses to sell that exact volume for a period of time for a fixed price.



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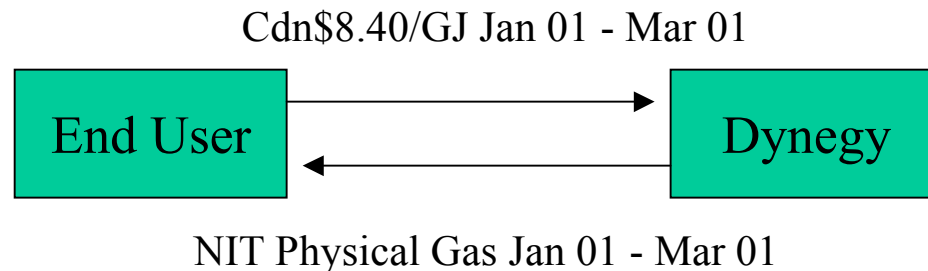


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# Participants and their Roles

- Speculating: A set of completed transactions that assumes risk in hope of a profitable gain
  - A company that Sells something that it does not own, with the belief that it will buy the asset back at a lower price.



Dynegy does not own an physical gas at this point in time.

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# Participants and their Roles

## Concept of Long and Short

- Long is equal to Buying or Owning or Receiving an asset
  - Risk is known - the asset value can only go to Zero
- Short is equal to Selling or Owing or Giving an asset
  - Risk is unknown - the asset value can go to infinity
- Hedgers identify things that they feel they can control (production, exploration, processing) and eliminate those they can not (price)
- Speculators assess odds of a particular outcome and compute a value for assuming this risk

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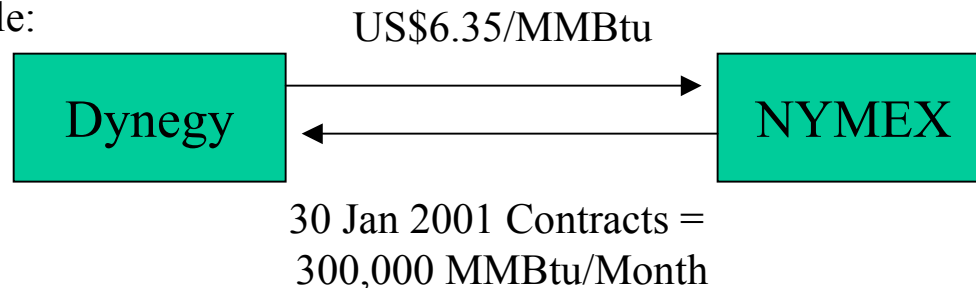


# Financial Tools

## Futures

Futures are contracts between individuals or companies and the Futures Exchange (e.g. NYMEX: New York Mercantile Exchange)

- The contract specifies a specific:
  - Volume: Minimum 1 contract = 10,000 MMBtu
  - Price: US\$/MMBtu
  - Delivery Location: Henry Hub, Louisiana
  - Future Delivery Date: NYMEX Natural Gas Futures go out 36 months
  - Example:



- Futures are based on physical delivery. You can take delivery if you desire and have the capability.

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# Financial Tools

## Options

- A CALL option is a contract between two parties
- The buyer of the call option has the RIGHT, but NOT the obligation to BUY a specific number of futures contracts (or any other specified asset)
- At a specific price
- For a specific delivery period
- On or before a specified exercise date.
- For this right the buyer pays the seller a per unit premium.



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# Financial Tools

## Options

– Example: Call Option for January NYMEX

### Futures

- Underlying Price: US\$6.35/MMBtu
- Strike price: US\$7.00/MMBtu
- Volume: 155 contracts (1,550,000MMBtu/Month = 50,000MMBtu/Day)
- Exercise Date: December 22, 2000
- Option Premium US\$0.28/MMBtu (US\$434,000)

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# Financial Tools

## Options

### Why would you buy a call option??

- You believe that the value of the underlying asset is going up
- The financial outlay of purchasing an option is much less than purchasing the underlying asset
- Less financial risk: You know the maximum amount you can lose, the premium outlay
- You need financial protection toward rising prices
- You believe that the price volatility of the asset is going to increase

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# Financial Tools

## Options

- A PUT option is a contract between two parties
- The buyer of the PUT option has the RIGHT, but NOT the obligation to SELL a specific number of futures contracts (or any other specified asset)
- At a specific price
- For a specific delivery period
- On or before a specified exercise date.
- For this right the buyer pays the seller a per unit premium.



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# Financial Tools

## Options

– Example: Put Option for January NYMEX

### Futures

- Underlying Price: US\$6.35/MMBtu
- Strike price: US\$5.70/MMBtu
- Volume: 155 contracts (1,550,000MMBtu/Month = 50,000MMBtu/Day)
- Exercise Date: December 22, 2000
- Option Premium US\$0.23/MMBtu (US\$356,500)

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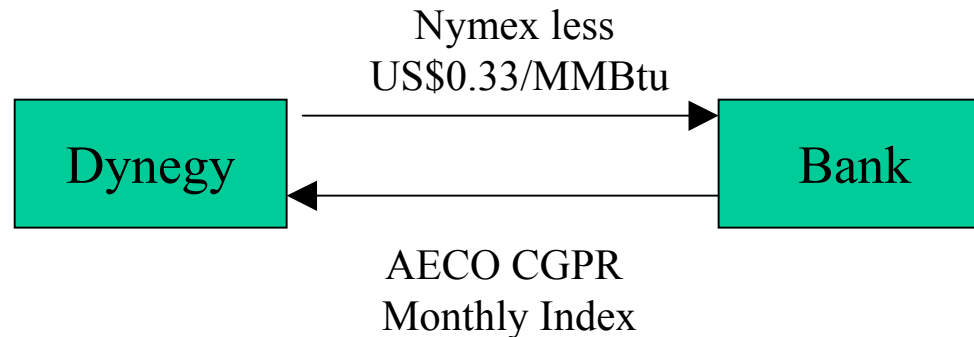
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# Financial Tools

## SWAPS

A SWAP is a contract between two parties for the exchange of one financial instrument for another (a swap of financial risk). These contracts are also considered exchange for differences. The contract specifies specific payment terms for each party.



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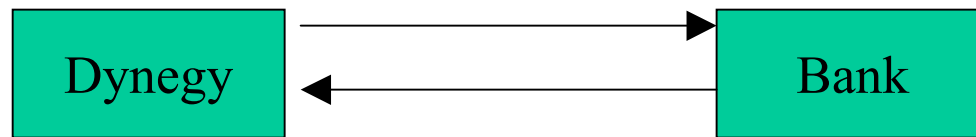
# Financial Tools

## SWAPS

The contract outlines specific payment terms for each party:

- Volume: The volume is the same for both parties
- Price: Any Currency or combination of Currencies
- Delivery Location: Any geographic location that has a “reported price” associated with the physical value of gas
- Future Delivery Date: No limit to the time period that can be traded

20,000MMBtu/day Nov 2002 - Oct 2003  
Nymex less US\$0.37/MMBtu



20,000MMBtu/day Nov 2002 - Oct 2003  
AECO CGPR Monthly Index

- 
- SWAPS are NOT based on physical delivery. This is a pure Financial Transaction

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# Financial Tools

## Derivatives

- Derivatives can be, but are not limited to, any combination of futures, swaps and options
- They are not limited to any specific time period, commodity or asset
- They always have a specific formula that documents/outlines the way in which payments will be made to & from each party
- As a risk management tool, you are trying to reduce the number of factors that will effect your income stream.



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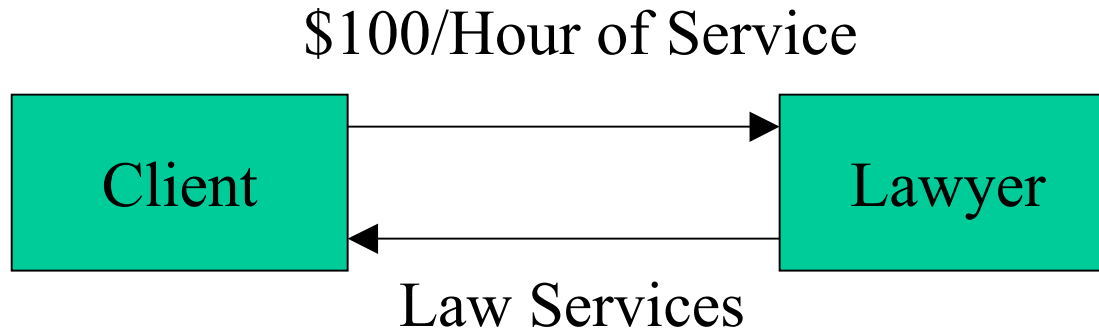


# Financial Tools

## Derivatives

Example:

- A lawyer's base salary is paid on billable hours
- The hourly rate is \$100/hour
- Total base salary is then a function of billable hours
- Total base salary = billable hours X \$100/hour



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# Real Life Example

- A Auto Manufacture wants to have all of its costs as a function of the number of cars it produces
- Natural Gas is one of its process inputs that is not a variable cost
- Dynegy is willing to take some risk in order to move the manufacture's gas cost from fixed to variable
- Dynegy is willing to become a partner in the manufacture's operation

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# Real Life Example

What Needs to be done???

- Manufactures production history
- Manufactures 2001 production goals
- Activities of management regarding Unions/Assets/Machinery
- Assume with a 95% confidence interval the manufacture will produce 75 cars per day
- All cash flows are in US Dollars
- AECO Market Price for December 2000 = US\$5.70/MMBtu

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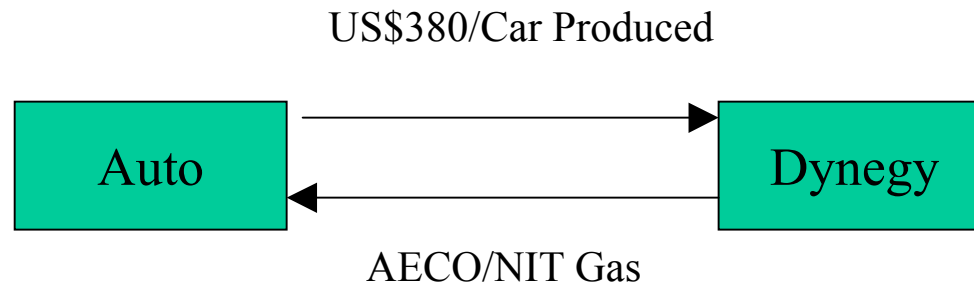
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# Real Life Example

What if:

1. AECO/NIT gas costs US\$5.70/MMBtu
2. Volume required 5000 MMBtu/Day
3. Total Cost/Day:  $5000\text{MMBtu} \times \text{US}\$5.70/\text{MMBtu} = \text{US}\$28,500$
4. Number of cars produced per day = 75
5. Total cost per car:  $\text{US}\$28,500 / 75 \text{ Cars} = \text{US}\$ 380 / \text{Car}$



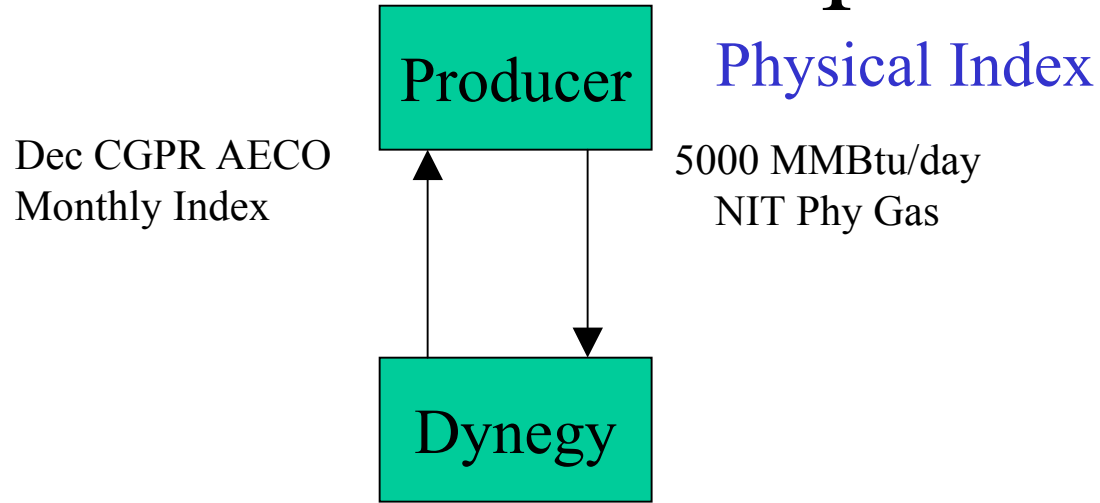
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# Real Life Example



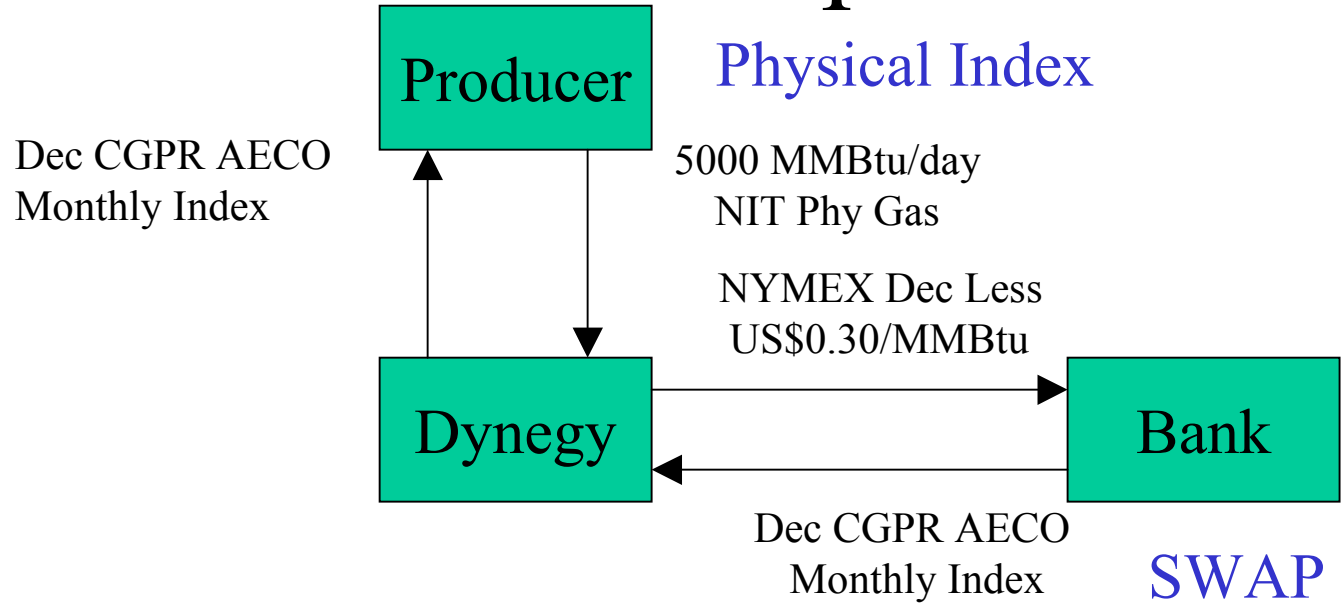
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# Real Life Example

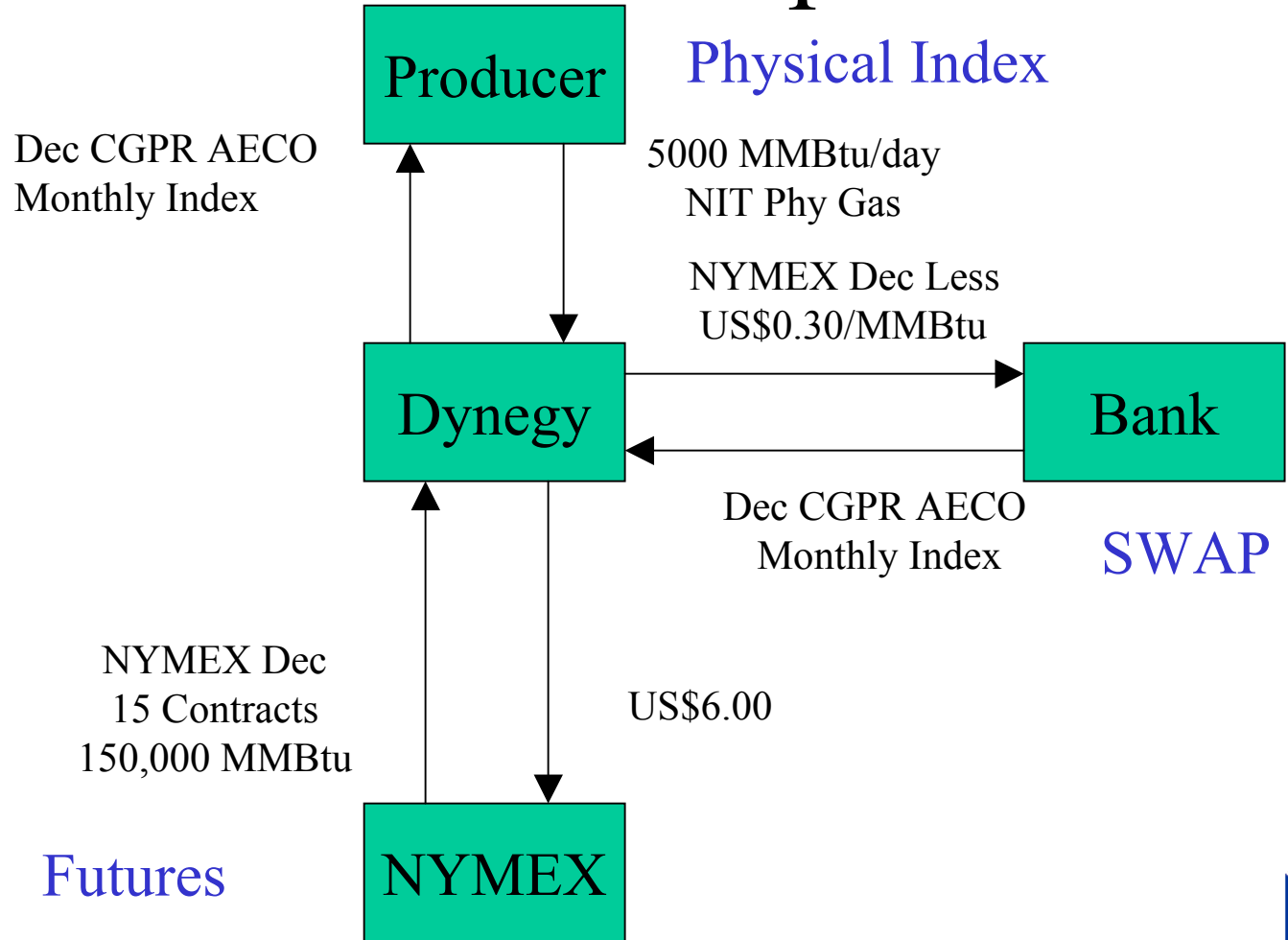


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# Real Life Example



Futures

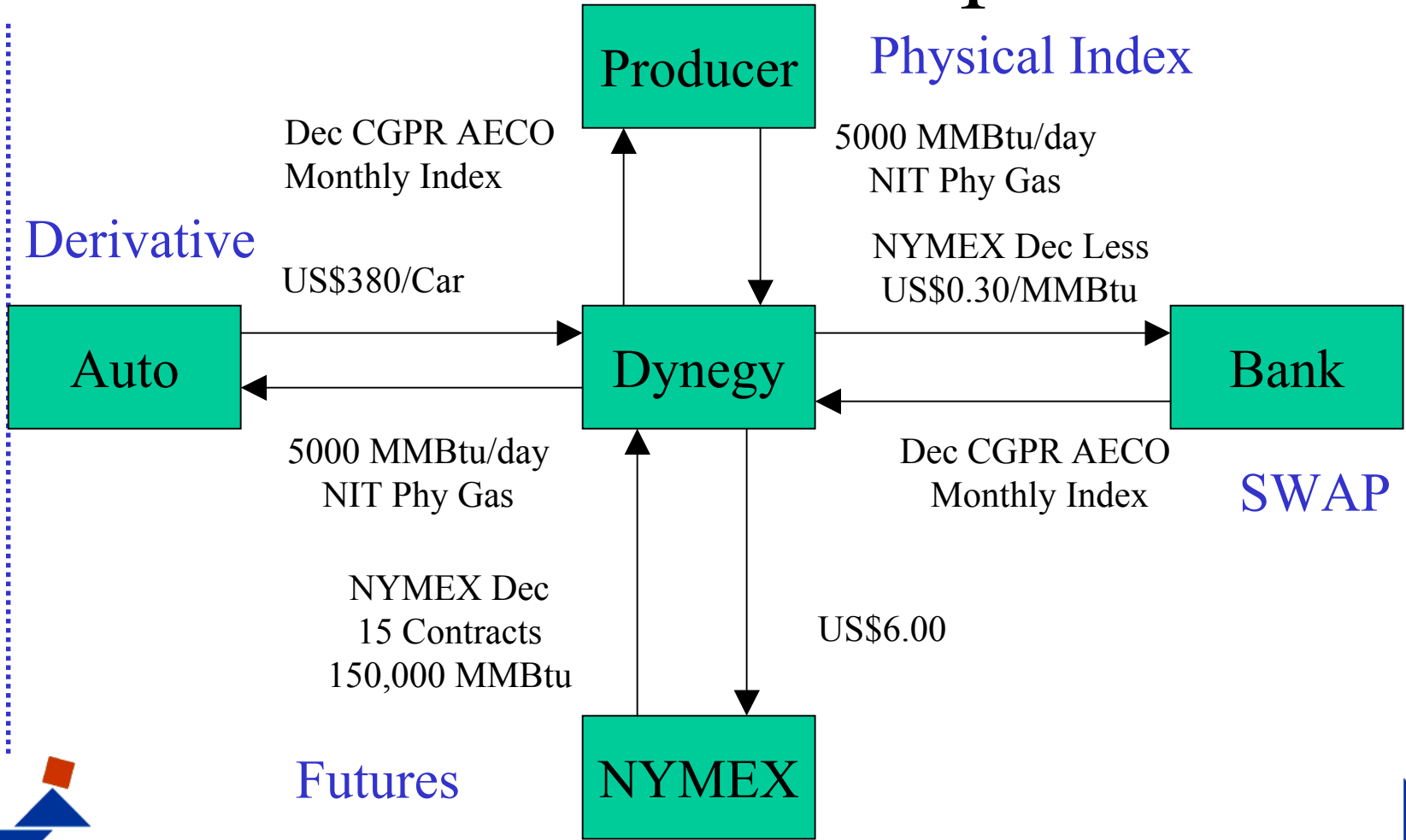
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# Real Life Example



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