

Is it possible to prevent?

# GLOBAL CLIMATE COLLAPSE

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# Climate Collapse

- The problem of the 21<sup>st</sup> century.
- Much worse than thought even 5 years ago
  - Climate change is faster
  - GHG emissions are higher than even the worse case assumptions
  - Climatic positive feedback
    - Arctic ice melting
    - Amazon burning down
    - Permafrost melting – methane release
  - Zero Action

# Consequences

- 6 – 10°C temp rise
- No plant life between the tropics
- Antarctic & Greenland ice caps melt
- Sea level rises 100m
- Oceans turn acid
- +90% extinction rate

# Why is nothing being done?

- Simply answer
  - money
- Complex answer
  - money

# Simple Answer

- Stopping GHG emission is expensive
- Need to reduce emission by 95%
- Cost US\$50 to \$500 per t. C equil.
- Per capital Australian GHG emissions
  - ~20 tonnes
  - Cost \$2000 to \$20,000 pa.
- Public willingness to pay
  - \$120 pa!
  - All western countries
  - Stable for the last 15 years

# Complex Answer

- Vested interests
  - Oil industry
- Infrastructure
- International co-operation

# Vested Interests

- A number of very powerful groups opposed to change
- Oil Industry
  - Extracted 100 trillion barrels oil since 1860
  - 100 trillion barrels to be extracted over 40 years
  - Current value of this oil
    - No action on GHG emissions - \$50 trillion
    - Urgent action on GHG emissions - < \$10 trillion

# Infrastructure

- Source of all our wealth
- Built over the last 100 years
  - 98% based on using fossil fuels
  - Interconnected
  - Has to be totally replaced
- What will it cost to replace?
  - Very difficult to get a firm answer on this
  - Estimates range from \$10 to \$200 trillion
  - ~0.5 to 10 years of total world GDP



# International Co-operation

- All current ideas for solving climate collapse require international co-operation
- No country wants to pay the cost unless all other countries pay
- Need to get everyone to join at once
  - USA out until ?
  - China out until after 2050
  - India out
  - These three are 75% of future emissions

# Any solution requires

- Closing the gap between what people will pay and what it will cost (>90%)
- Overcome all vested interests
- Replacement of all current infrastructure
- All countries agree

AND

- Accomplished in the next 10 years
- Is there any hope?

# Solution

- Push all the costs on to future generation
- Why?
  - They receive most of the benefits
  - Will be much wealthier than us
  - They can't say no!
- How to do this?

# Carbon Bank

- Limited number of countries establish a new bank – **Carbon Bank**
- Debt underwritten by the member countries
- Bank issues debt – **Carbon Bonds**
- Money raised from bonds is spent buying existing infrastructure and building new non-GHG emitting infrastructure
- Countries joining later are allocated a negotiated share of the total debt

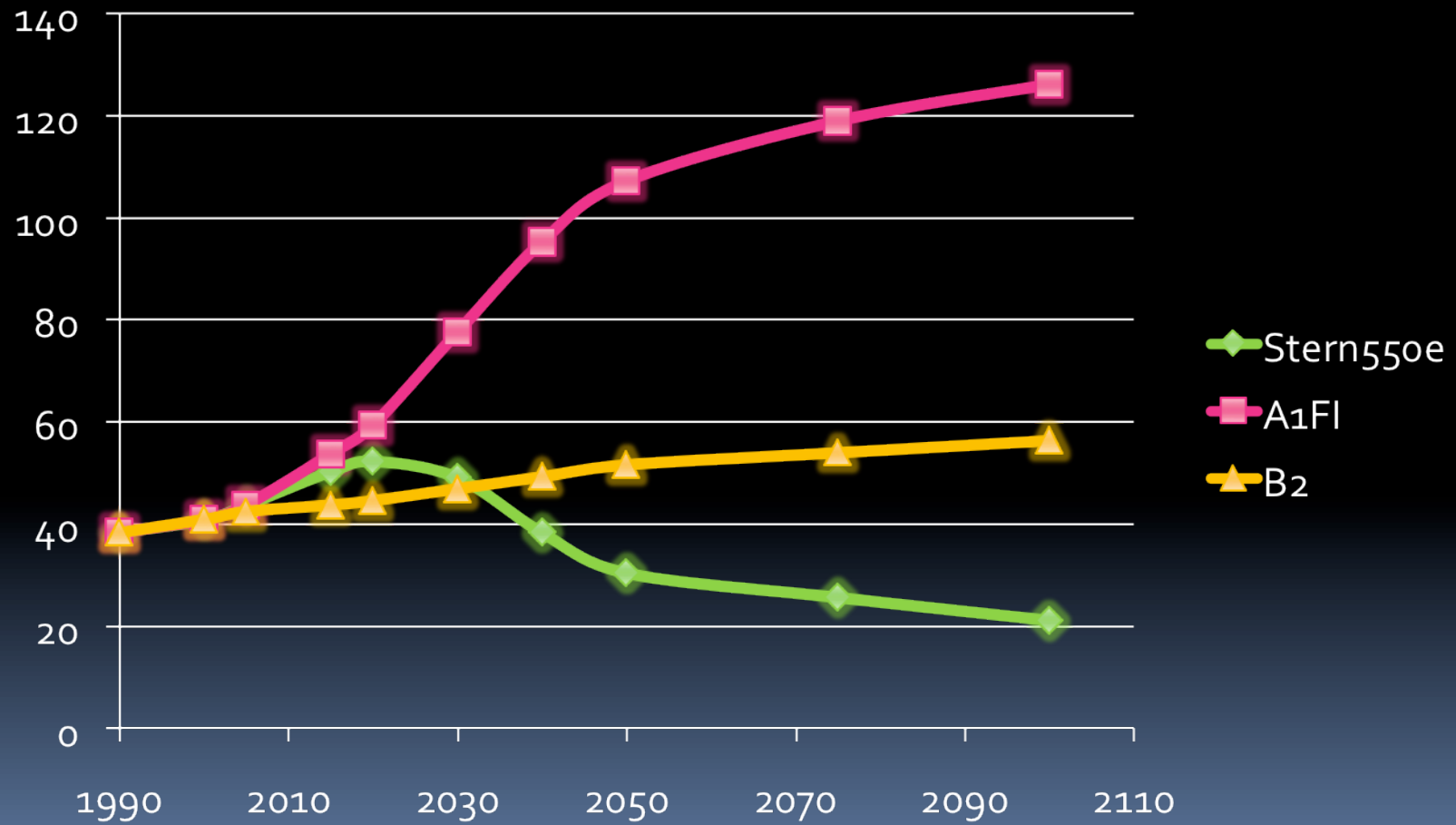
# Carbon Bonds

- 50 year, sovereign-backed, inflation indexed, zero coupon bonds
- Zero coupon bonds
  - Standard bond
  - Pay no interest, sold at a discount to face value
  - Inflation-indexed, sovereign-backed bonds pay equivalent of 2.2% pa
  - Carbon bonds would sell for ~30% face value
  - No repayments for 50 years

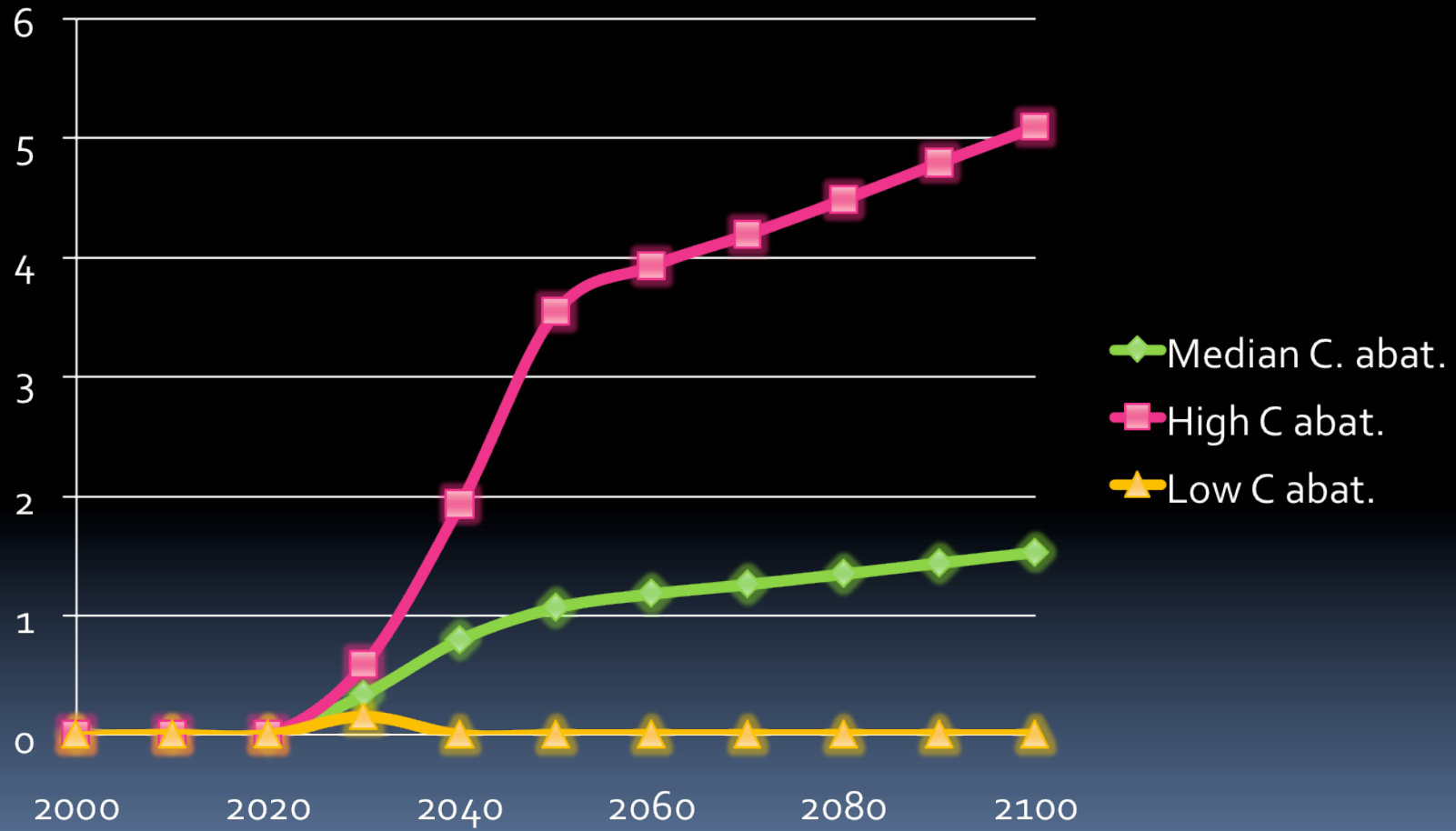
# Assumptions

- Worst case emissions (IPCC A1F1)
- Anderson 2006 high and low carbon costs
- GDP growth rate
  - 2020-2050 3.90%
  - 2051-2100 2.35%
- Bond interest rate & term
  - 2.5% inflation indexed
  - 50 years
- US\$ 2000

# CO<sub>2</sub> Emissions

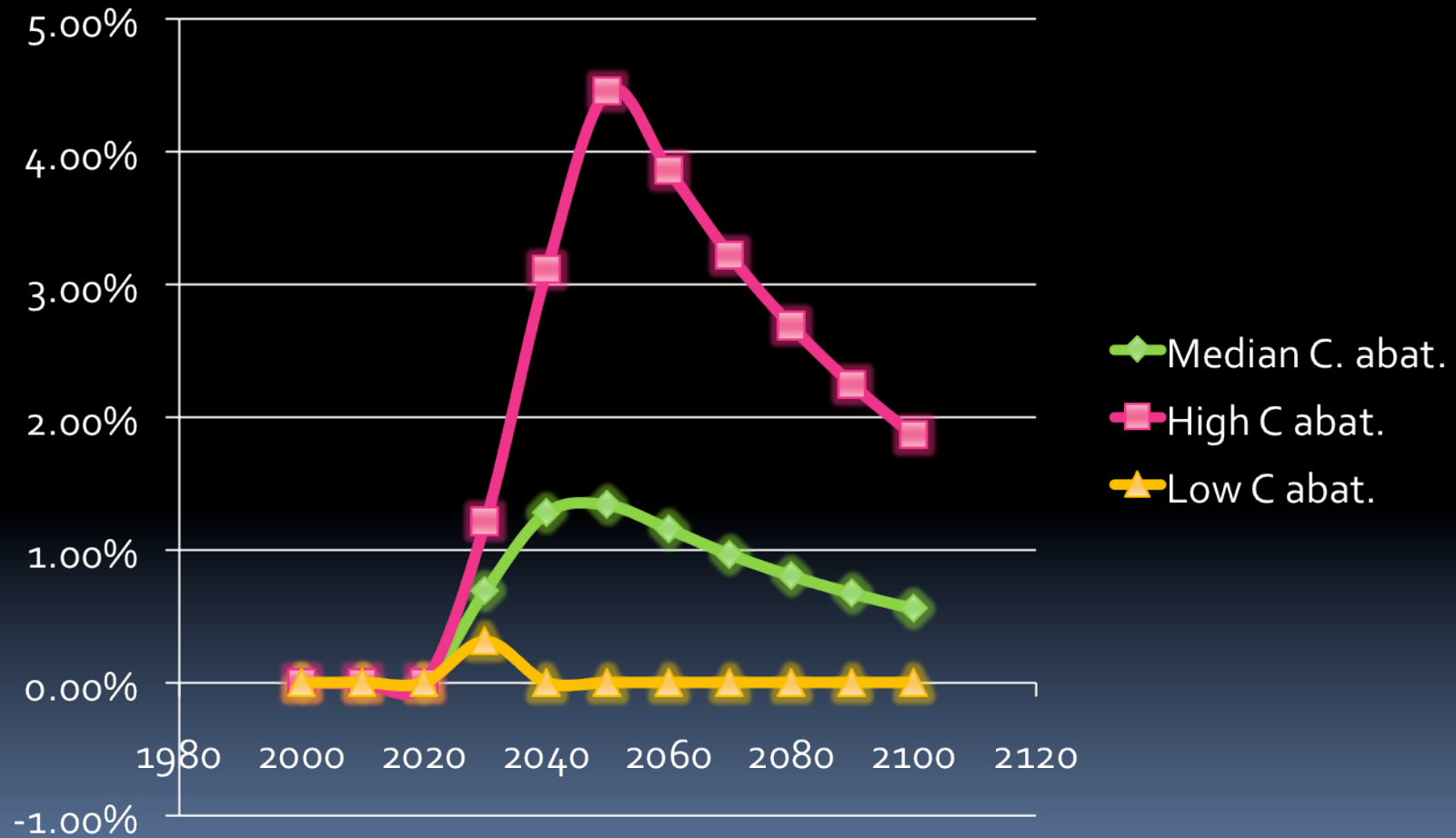


# Bonds issued

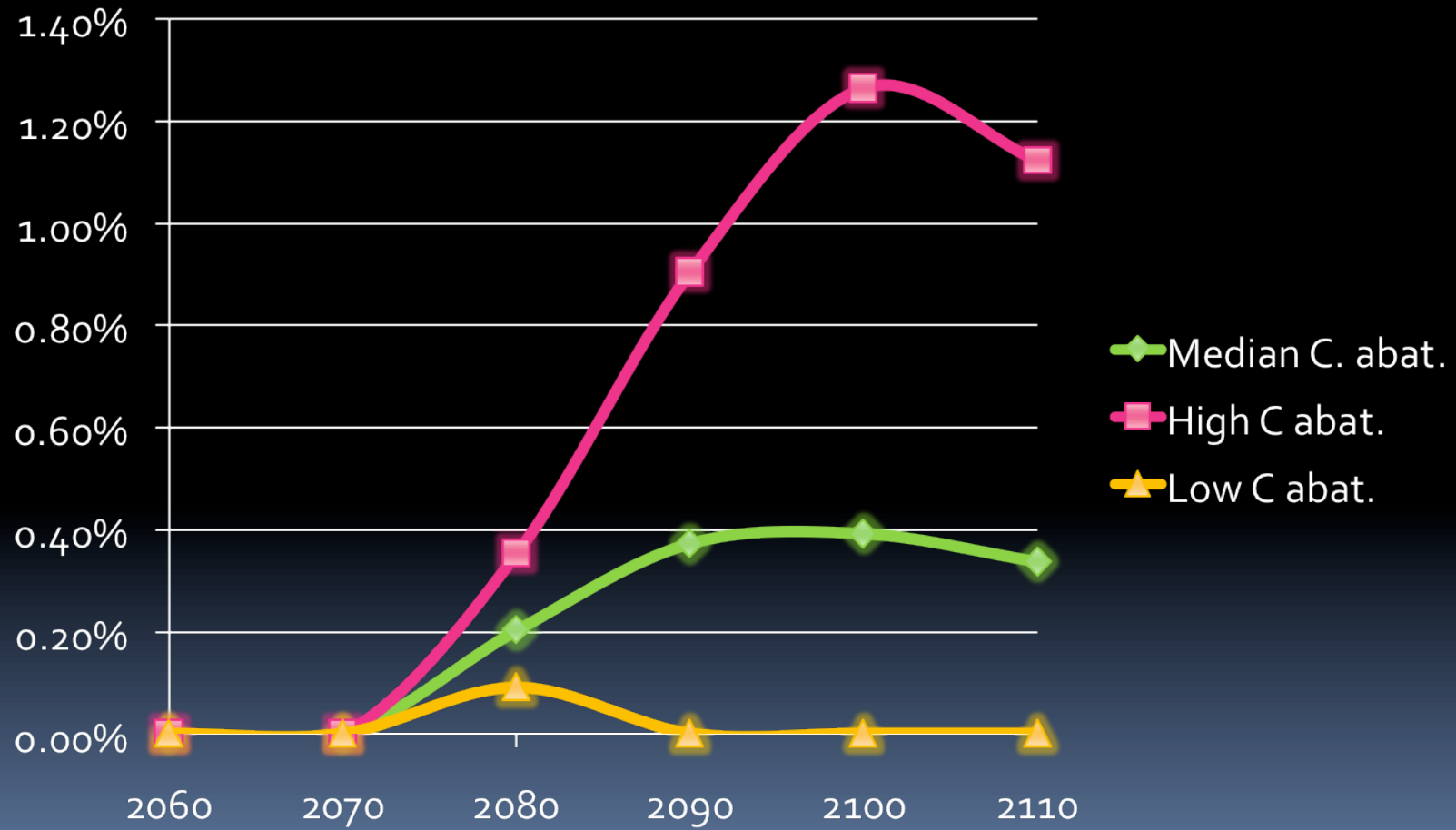




# Expenditure % GDP



# Cost % GDP



# Other areas

- How to get all countries to join in?
  - Game theory
  - No deadlines
- How to best spend the money
- What preliminary activities are needed?



# Questions