How to give a good talk

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To effectively communicate your work
and promote yourself.

Public speaking is a lifetime skill

Tell a compelling story

Preparation and practice!

Form and content are both important

Speak with conviction

Objectives

Motivate people to appreciate your problem, its applications and your contributions

Motivate people to pay attention to your work, cite your papers, and to use your ideas

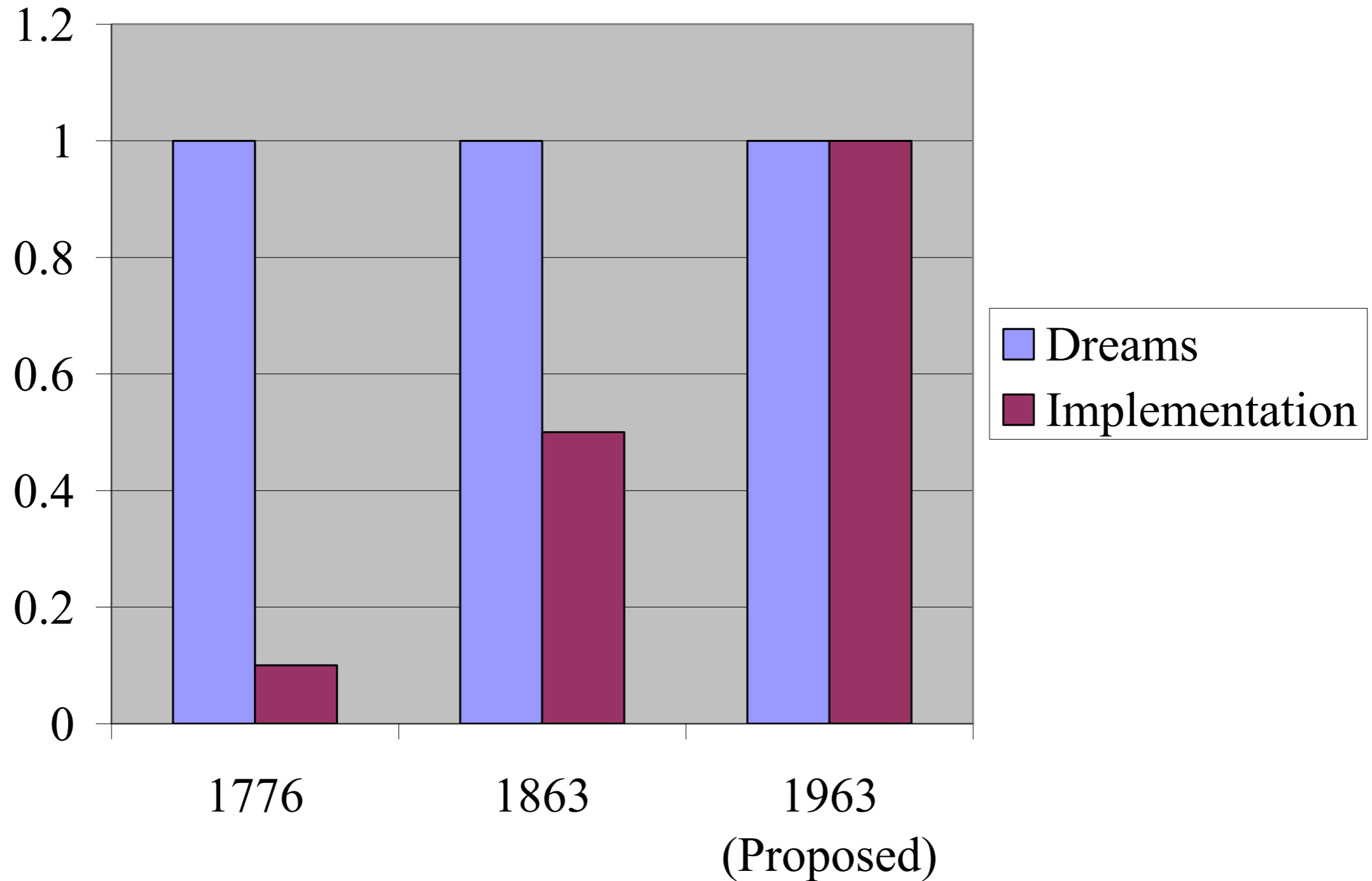You rarely need to explain all the mathematics or coding issues you faced

Mainstreaming Interethnic Inclusiveness

Martin Luther King Jr.
28 August 1963
Lincoln Memorial
Washington D.C.

(from the web)

Track record on interethnic inclusiveness

Operationalizing best practices

- Nation's creed should be implemented more inclusively

- Descendants of former slaves and of former slave owners should synchronize sitting at same table

- Primary evaluation criterion for children should be content of character

the rest of the slide, so this VBB is not necessary.

Spray On Foam Insulation, a fragment
of which caused the hole in the wing

A model to estimate damage to
the tiles protecting flat surfaces
of the wing

...llet

...ium-small diamond
...iny square bullet

( ) parentheses ending level 5

...readed Executive Summary,
a headline: "Test Data Indicates
...tion." This turns out to be
...tives, at least those who don't
read far beyond the title.

the *choice of models* used to predict
...ghts, are foam–debris models
...? How can "conservatism" be
...son of a spreadsheet model and
...dence means divergent evidence,
...s of analytic "conservatism"
...ism by presentation consumers.
...cal tactic that substitutes verbal
...assessments.

the seemingly reassuring head–
...ullets at the end of the slide
...mary. This third-level point
...hat is, the debris hit on the
...side of test database." How
...ill tell us.

Review of Test Data Indicates Conservatism for Tile Penetration

- The existing SOFI on tile test data used to create Crater was reviewed along with STS-87 Southwest Research data
  - Crater overpredicted penetration of tile coating **significantly**
    - Initial penetration to described by normal velocity
      - Varies with volume/mass of projectile (e.g., 200ft/sec for 3cu. In)
    - **Significant** energy is required for the softer SOFI particle to penetrate the relatively hard tile coating
      - Test results do show that it is possible at sufficient mass and velocity
    - Conversely, once tile is penetrated SOFI can cause **significant** damage
      - Minor variations in total energy (above penetration level) can cause **significant** tile damage
  - Flight condition is **significantly** outside of test database
    - Volume of ramp is 1920cu in vs 3 cu in for test

BOEING

...uding the slide reports that the
...estimated to be 1920/3 = 640
...the tests of the model!! The
...eview of Test Data Indicates

Here "ramp" refers to foam debris (from the
bipod ramp) that hit Columbia. Instead of the
cryptic "Volu... of ram..." say "estimated volume
of foam debris ...

Anatomy of a Talk

The Story is King

A good talk is good story-telling

- ▸ know your audience

- ▸ design one story around one key idea

- ▸ every element should help develop the story (you can't say everything you know)

Find your story now. Think big!

- ▸ how could your research change the world?

- ▸ how could it be used by others?

Know your audience

Tell the right story

- ▸ for students, faculty, practitioners, lay, specialists, ...
- ▸ seminar, conference, job talk, elevator, colloquium, ...

Don't assume they know too much!

- ▸ resist the temptation to go too deep too quickly
- ▸ what would you understand the first time you met with your supervisor?

The basic story

Motivation and problem

Development of an approach

Results and conclusions

Motivate the listener

Provide context: Why should someone care?

▸ your problem is fascinating

▸ there are myriad practical applications (*be careful*)

▸ your approach is widely applicable to other problems (*that are relevant to the people in your audience*)

▸ impressive empirical results are always good to show

Don't be afraid to spend a few minutes on the motivation

Motivate the listener

Problem statement

Inputs

Outputs

Concrete examples

Assumptions

Flow

Signposting

Logical development of ideas

Alternate general-particular. Give a concrete example for each abstraction

Reiterate important points

Outline

- Motivation

- Outline slide

- Related Work

- Our approach

- Experimental Results

- Future Work

- Conclusions

Conclusion:

An outline slide is usually a waste of time

Instead of an outline

Tell the story well, and the flow will be clear.
(few novels or movies begin with an "outline slide").

Signpost to keep the flow clear

Use the overview to provide an outline, e.g., ...
There are three key elements to our formulation:

- ▸ Mathematical model

- ▸ Objective function

- ▸ Optimization algorithm

Related Work

Background that you build on

Summary of what people are doing

Only cite what is necessary for your story

- ▸ For each citation, what is the purpose? How does it enhance the story?

Cite related work throughout the talk in context rather than just on one or two slides at the beginning.

Conclusions and Future Work

Summarize briefly

Be honest about limitations

Future work: what does it add to your story?

Delivery

Scripting

You must plan what you are going to say

▸ the introduction is absolutely critical. Plan carefully.

▸ plan the first two or three sentences for each slide

▸ goal is not to memorize the words but rather to get the story straight, and be familiar with at least one way of saying what you want to say clearly, without search for words on the fly.

Punctuate Transitions

Clear pauses and recap between sections

- ▸ helps people follow through changes in direction
- ▸ helps people rejoin the talk after they get lost

Keep it simple and consistent

Nomenclature

- ▸ Avoid jargon and expressions not all people know

- ▸ Use the same terms consistently throughout
  (e.g.. choose one of: parameter, variable, unknown, ...)

Practice, Practice, Practice!

▶ alone

▶ to the mirror

▶ to friends

▶ to colleagues

▶ use video

Voice

Project

Enunciate

Make sure you are heard

Calm Conviction

Dress well, stand calmly and address audience, and don't distract audience with um's and ah's, or any unnecessary nervous movement.

Other points:

▸ laser pointers - be careful

▸ speak to the audience, not the slide

▸ arrive early, and test the projector

▸ finish on time or early

Get feedback: You often don't realize what you're doing unintentionally until someone tells you.

Questions and Answers

When you are asked questions during or after a talk:

- ▶ think before answering (if possible)

- ▶ repeat question so people know which question you are answering (it may not be what was asked)

- ▶ when you are not sure... say so!

Design

What are slides for?

Slides are useful, ... but less is often more.

- ▸ *visualization*: diagrams, equations, videos, ...

- ▸ *emphasis*: to ensure that key aspects of your approach and contributions are highlighted

- ▸ *roadmap*: where are we? why are we here?

Visual language:

- ▸ Design appearance to effortlessly guide attention

- ▸ *WYPIWYG:* What you perceive is what you get.

Inference

Likelihood

Prior

$$p(X_1, X_2, ..., X_{10} \mid I) = \prod_i \phi_i(I \mid X_i, V_i, \hat{V}_i) \prod_{(i,j) \in E_K} \psi_{ij}^K(X_i, X_j) \prod_{(i,j) \in E_O} \sum_{V_j} \sum_{V_j} \psi_{ij}^O(X_i, V_i, \hat{V}_i, X_j, V_j, \hat{V}_j)$$

Need to marginalize over hidden binary variables V_i, $\hat{V}_i$

Message Passing:

$$m_{i \to j}^O(X_j, V_j, \hat{V}_j) = \int_{X_i} \sum_{V_i} \sum_{\hat{V}_i} \psi_{ij}^O(X_i, V_i, \hat{V}_i, X_j, V_j, \hat{V}_j) \, \phi_i(I \mid X_i, V_i, \hat{V}_i) \prod_{k \in A_i / j} m_{k \to i}^O(X_i, V_i, \hat{V}_i) \, m_{k \to i}^K(X_i)$$

$$m_{i \to j}^K(X_j) = \int_{X_i} \sum_{V_i} \sum_{\hat{V}_i} \psi_{ij}^K(X_i, X) \, \phi_i(I \mid X_i, V_i, \hat{V}_i) \prod_{k \in A_i / j} m_{k \to i}^O(X_i, V_i, \hat{V}_i) \, m_{k \to i}^K(X_i)$$

Belief:

$$b_i(X_i) = \sum_{V_i} \sum_{\hat{V}_i} \phi_i(I \mid X_i, V_i, \hat{V}_i) \prod_{k \in A_i} m_{k \to i}^O(X_i, V_i, \hat{V}_i) \, m_{k \to i}^K(X_i)$$

ε R5
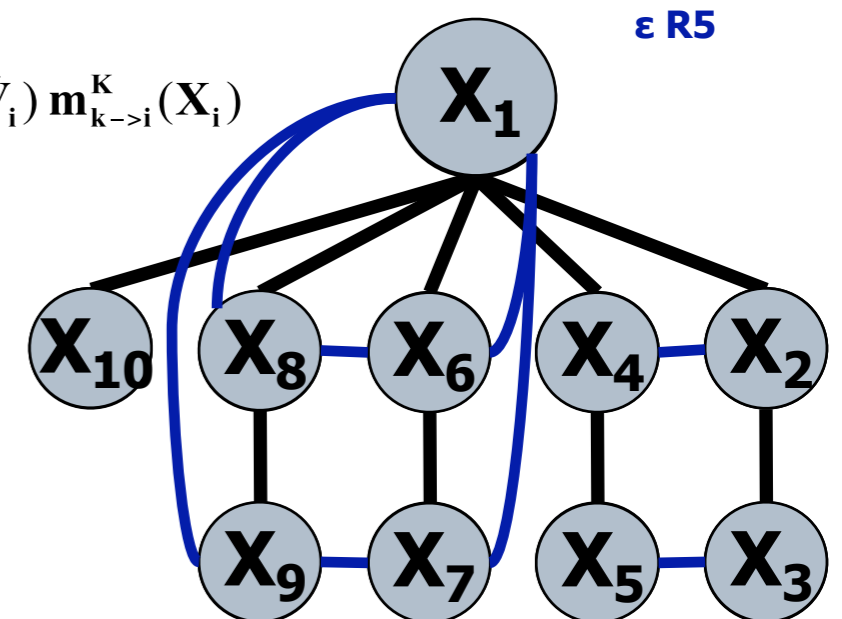
Motion Model: Control Loop

Executed for every hypothesis in our multi-hypothesis tracking framework

Pick the control policy π

Using the selected control policy, generate the next intended kinematic pose q_d

Motion Planning

Kernel Regression: from database of MoCap

q_d

$\pi^A \longrightarrow$

q_d

Motion Control

q_d

m

Establish motion constraints m to implicitly generate motor forces that would drive the figure towards q_d

Initialization

q_0 $\dot{q}_0$

$[q_1, \dot{q}_1]$

m

Dynamics

Crisis Physics Engine

$$\begin{bmatrix} q_{t+1} \\ \dot{q}_{t+1} \end{bmatrix} = \int_{\Delta t} f_{eom}\left(\begin{bmatrix} q_t \\ \dot{q}_t \end{bmatrix}, m \right) dt$$

Newton's second law

Numerically integrate and update dynamic pose

Outline
Simple slide with three points shown all at once
Slide with two columns: items and a graphic

Simple slide with three points shown all at once
    Simple slide with three points shown in succession

Slide with two columns: items and a graphic

Use of text

One idea per slide

- ▸ clutter on slides is dangerous -
- ▸ don't worry about "1 slide per minute"

Text should not duplicate what you plan to say

- ▸ summarize main points and use words sparingly (don't expect people to read sentences)
- ▸ avoid unnecessary bullets (esp. multiple levels)

(Note: These slides are for teaching, not a talk)

Fonts

Fonts must be legible

- ▶ use plain readable fonts

- ▶ large (but not too larger) - at most 8-10 words / line

- ▶ line spacing is as important as font size

- ▶ use italics and bold sparingly

Colour

- ▶ use (good) colours sparingly

- ▶ contrast

Consistency in font type, size, colour, ...

Figures

Visibility is critical: linewidth, axes, labels, ...

▸ often these must be redone from figures in your paper

Use text to help guide interpretation

▸ e.g., "lower energy is better"

Display only what you plan to talk discuss

Before

Baselines: "Frozen" and Emission (IPCC WG III AR4, Ch.3, p.220)
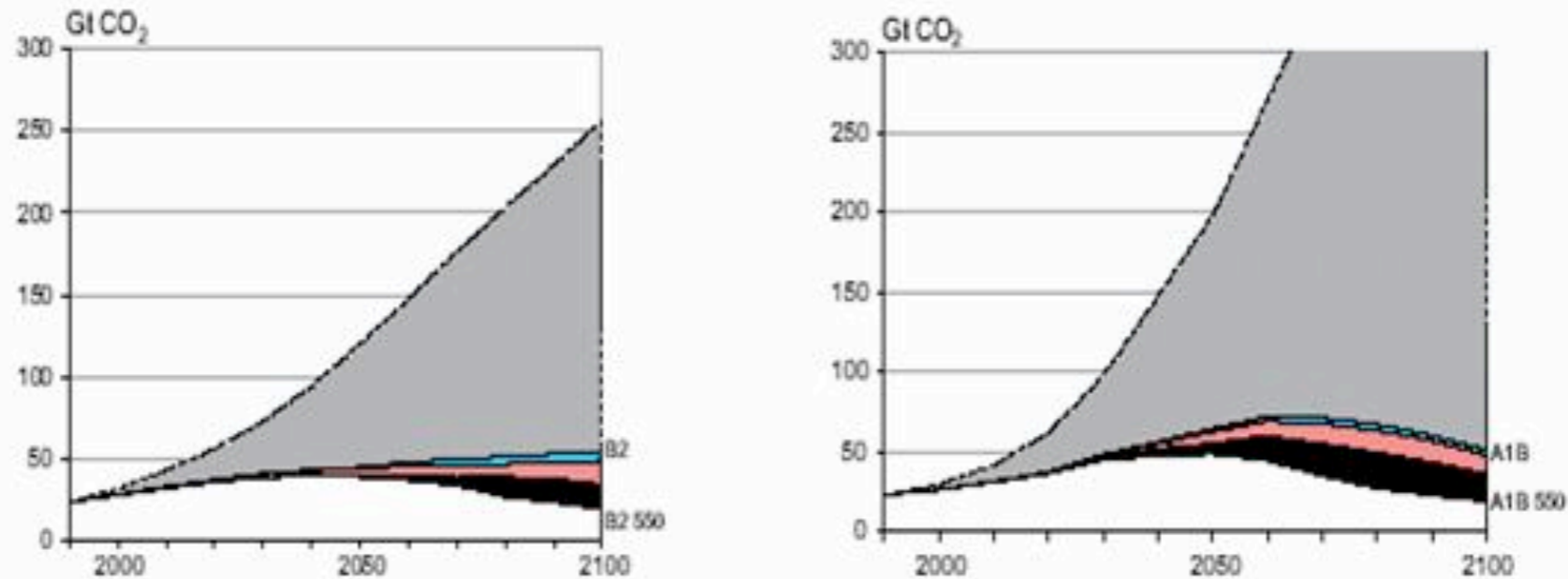
Figure 3.33: *Impact of technology on global carbon emissions in reference and climate mitigation scenarios.*

Note: Global carbon emissions (GtC) in four scenarios developed within the IPCC SRES and TAR (A2, B2 top and bottom of left panel; A1FI and A1B top and bottom of right panel). The grey-shaded area indicates the difference in emissions between the original no-climate policy reference scenario compared with a hypothetical scenario assuming frozen 1990 energy efficiency and technology, illustrating the impact of technological change incorporated already into the reference scenario. Colour-shaded areas show the impact of various additional technology options deployed in imposing a 550 ppmv CO_2 stabilization constraint on the respective reference scenario, including energy conservation (blue), substitution of high-carbon by low- or zero-carbon technologies (orange), as well as carbon capture and sequestration (black). Of particular interest are the two A1 scenarios shown on the right-hand side of the panel that share identical (low) population and (high) economic growth assumptions, thus making differences in technology assumptions more directly comparable.

Source: Adapted from Nakicenovic et al. (2000), PCC (2001a), Riehl and Roehrl (2001), and Edmonds (2004).

Courtesy of Midori Hyndman

After

Breakdown of IPCC B2 scenario

Courtesy of Midori Hyndman

Before
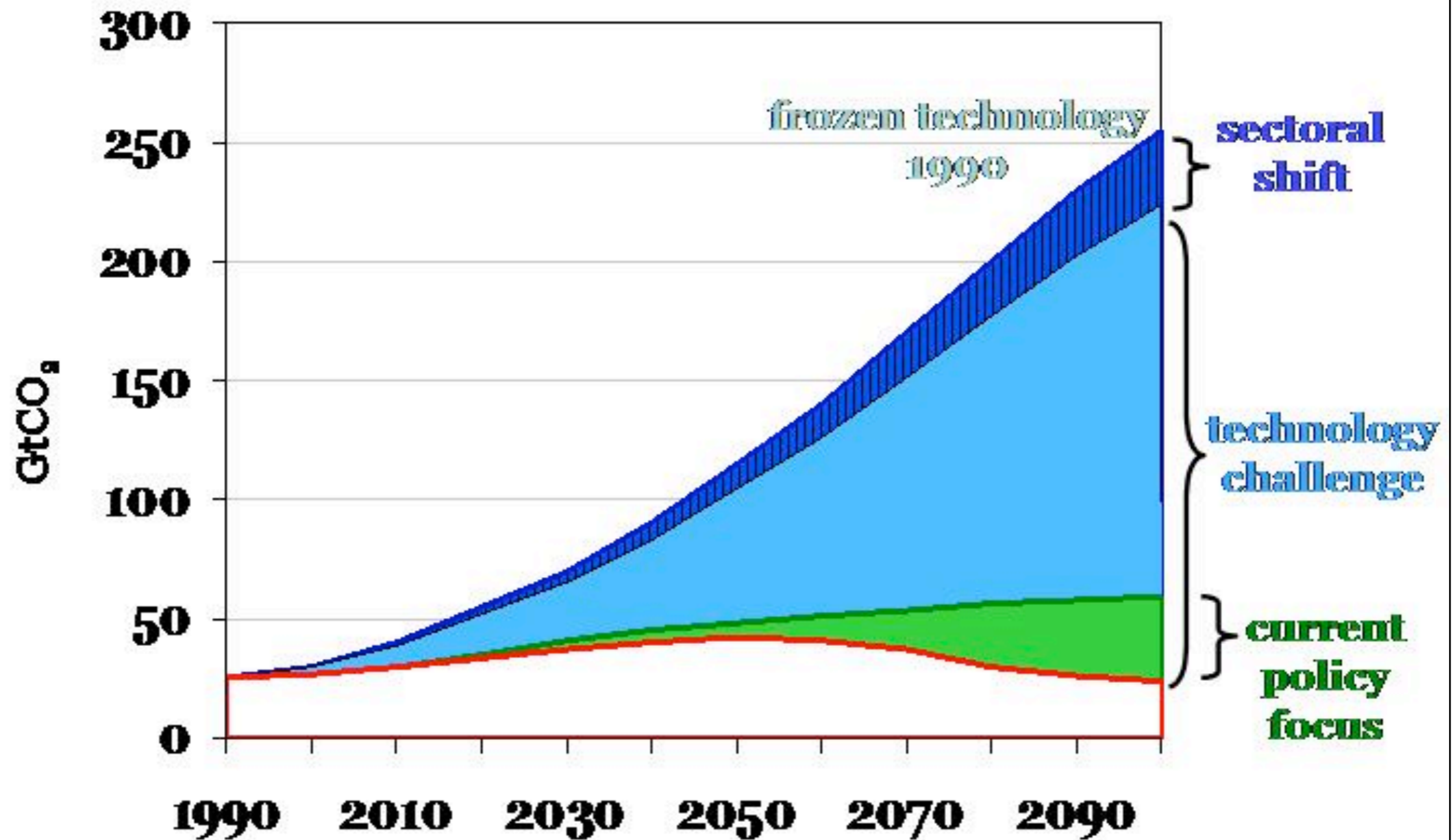
The Imperative

o Increasing pressure on our air quality
  - population growth
  - vehicles
  - urbanization
  - industrial development
  - transboundary pollution

o Canadians are concerned about air quality
  - 88% of those polled were concerned about quality of air we breathe in Dec. 2008 Environics survey

o Governments need to work together for health and environmental benefits and best use of air management resources – current economic situation makes this more important

1

Courtesy of Midori Hyndman

After

The Imperative

88% of Canadians are concerned about air quality

Dec. 2008 Environics survey

industrial development

transboundary pollution

vehicles

urbanization

population growth

Courtesy of Midori Hyndman

Equations

Use with caution - nothing gratuitous

Ensure equations are readily visible

- ▸ large font size

- ▸ well formatted (*latexit* or *texpoint*)

- ▸ define all notation (on slide and verbally)

Repeat equations from slide to slide where appropriate (don't ask people to remember that equation from a previous slide)

Other Points

Talk about everything on your slides

Avoid placing material near the bottom

Don't waste time creating fancy animations

Slide numbers, caned templates, logos, names, etc are generally just a distraction

Public speaking is a lifetime skill

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