

Exploring Options for Producer Involvement in Wheat and Barley Variety Development

Meeting with Wheat and Barley Variety Working Group



Marriott Courtyard, Saskatoon

November 30, 2015

Introduction

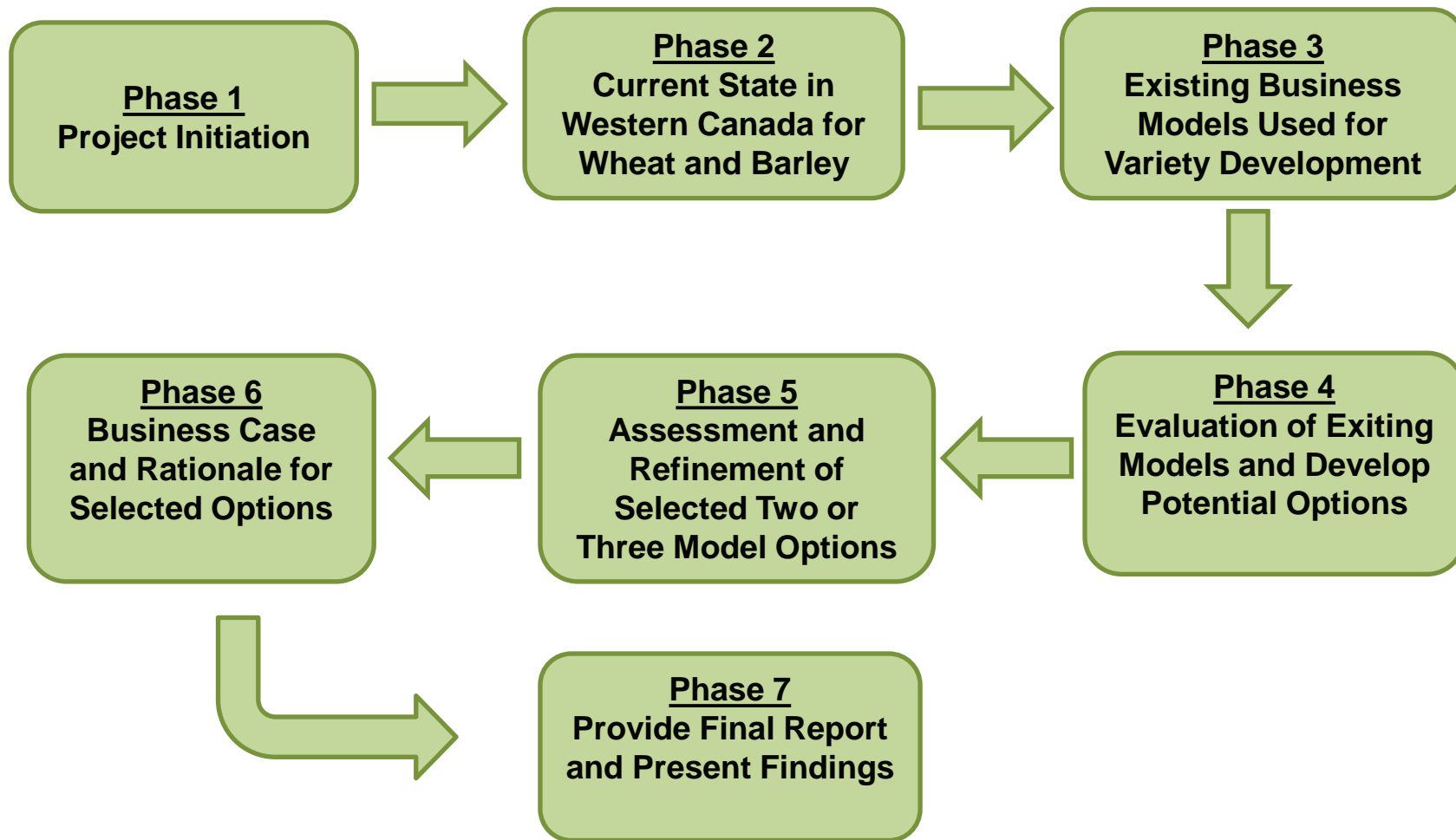
Team Members

- **John Groenewegen**
- **Richard Gray**
- **Bob Hyde**
- **Shelley Thompson**

Project Objective

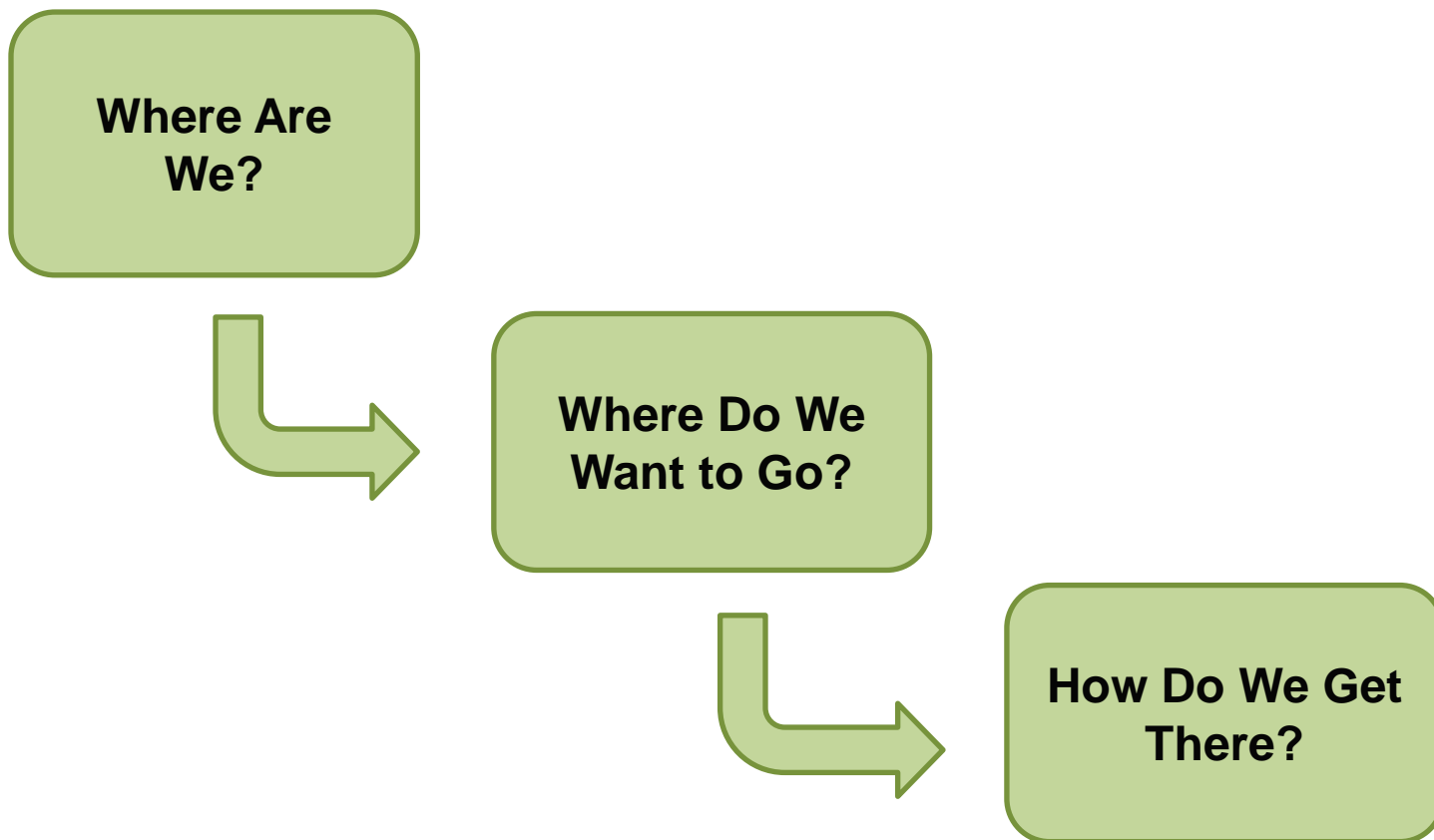
“to conduct an objective business case analysis of a range of options for producer involvement in wheat and barley variety development”.

Project Phases Supporting the Working Group



This has been a 9-month journey with input from the Working Group and Managers.

Developing Potential Producer Involvement Options



Our deliverable is the rationale and business case for (two or three) models for producer involvement in variety development – which can be used to stimulate further producer discussion on producer involvement.

Some Context

- Producers fund variety development - \$7.5 million last year;
- Transition in check-off funds – Western Canada Deduction ends in 2017;
- Producers are in agreement that variety development creates value for producers;
- Producer voice and direction on variety development is necessary;
- Necessary for producers to be involved in variety development – the issue is how!

Working Group goal:

“have world class sustainable wheat and barley variety development programs contributing to increased net profitability per acre for Canadian farmers through continual improvement of wheat and barley varieties”

Recent Funding Levels

- **By WGRF via check-off funds (~ \$6 million);**
- **By Commissions via check-off funds (~ \$1.5 million)**
- **By AAFC and NRC (~ \$31 million)**
- **By provincial governments (~ \$9.7 million)**
- **By private sector (~ 7.9 million)**

Annual spending on wheat and barley variety development is in the neighborhood of \$56 million, with the majority being taxpayer dollars.

Strengths

- **Dedicated geneticists and plant breeders at universities and in government agencies;**
- **A few centres in western Canada with expertise in variety development;**
- **A high rate of return to producer and public investments in variety development;**
- **Producer check-off funding available for variety development;**
- **Funding model used by WGRF invests in smaller classes of wheat and barley, in addition to large acreage classes;**
- **Producer funding (through WGRF) of variety development at public institutions provides producer access to germplasm;**
- **Germplasm stays within the variety development system in western Canada**
- **There is the ability to respond quickly to issues such as low gluten strength;**
- **Producer investment promotes producer needs and assists in influencing priorities;**
- **Recent public funding of network projects has created partnerships that can address some of the pre-breeding challenges;**
- **A number of producer groups have participated in variety development management;**
- **Existing organizations allow for producer participation in co-ordinated research.**

Strengths – positive features of the current system

Challenges and Weaknesses

Where Are We?

- **Wheat and barley production can occur with minimal yield drag using farmer saved seed, which in turn discourages private sector investment in variety development;**
- **Biological and economic factors limit the opportunity for value capture by plant breeders;**
- **A low probability of a disruptive technology in wheat that results in much higher yields;**
- **A low level of private corporate sector investment in variety development of wheat and barley (\$7.9 million per annum) due in part to the inability to exclude recurring use of seed;**
- **A lower level of overall investment in wheat and barley plant breeding when compared to other crop kinds (e.g., canola, corn and soybeans), or to other jurisdictions (e.g., Australia and the EU);**
- **Moving forward, there is no single obvious producer-led group for coordinating variety development research, creating leadership uncertainty;**
- **There is no coordinated system for EPR collections today, making it difficult for breeders to use EPRs as a way to capture value;**
- **Royalty-free farm saved seed using existing varieties may limit the willingness of producers to pay for and adopt new varieties if an EPR system was in place on new varieties;**
- **The increased use of project-based network funding has made it more difficult to make long term investments in human capital and research facilities.**

Challenges – features of the current system needing improvement

Opportunities

- The new *Agricultural Growth Act* enables the implementation of an EPR system to create a royalty revenue stream to plant breeding companies and resulting incentive to invest more funds in variety development;
- UPOV 91 enables product developers to capture value through use agreements and contracts;
- Private sector partnering can occur with producers and public sector research entities on variety development initiatives;
- Heightened levels of producer understanding, interest and involvement (i.e., investment) in variety development;
- Tools allow for easier breeding (e.g., marker assisted selection) are available to use that are supported by on-going research ;
- There is a base of experience, expertise, and elite germplasm (in the public sector) for the sector to build from;
- Research capacity in basic discovery and pre-breeding activities could be further strengthened.

Opportunities – areas to support growth

Threats

- **Reliance on project-based funding for pre-breeding research has the sector is vulnerable to non-renewal of these types of projects;**
- **A unilateral move by AAFC to exit wheat breeding without a well-funded alternative could leave wheat and barley producers without a viable breeding system;**
- **Fewer research dollars provided to universities will reduce the supply of newly trained graduates in genetics and plant breeding;**
- **Fewer public funds are available for plant breeding efforts, particularly funds available for basic discovery;**
- **Producer Commissions could decide not to collaborate/coordinate on variety development, which reduces the efficiency of funds collected for variety development;**
- **An EPR based royalty system could result in most royalty revenues accruing to private shareholders rather than as investment in breeding;**
- **Continued investment in research and resulting higher value-returns at the producer level for the production of crops other than wheat and barley, which could limit future wheat and barley growth;**
- **Expansion of corn and soybeans in parts of western Canada could continue to replace wheat and barley acres.**

Threats – areas needed to defend against and risks to mitigate.

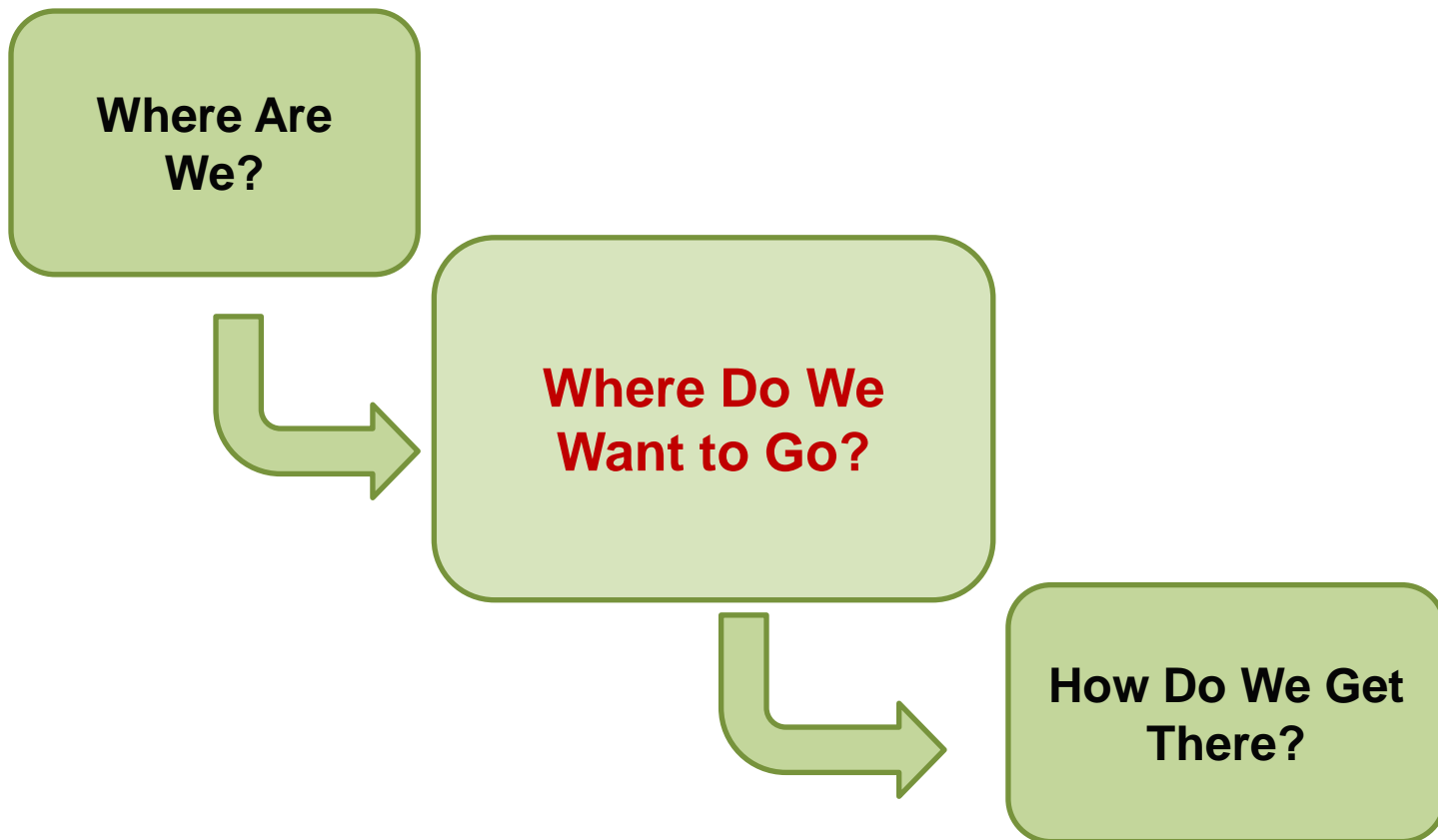
The Critical Issues

Where Are We?

- **What should producer involvement in variety development look like?**
- **How can farmers best lead and influence variety development?**
- **What models or approaches can be used to ensure that the appropriate level of pre-breeding research be sustained?**
- **Should the system evolve to enable a royalty revenue stream to product developers to reward variety development successes;**
- **How should producers capture value based on their involvement and investment – through improved varieties, or through better varieties and a royalty stream to fund more varietal development?**
- **What actions, if any, are required to improve the competitiveness of wheat and barley to other crops kinds in western Canada?**
- **Are structural changes necessary to improve the future efficiency of producer funded/directed research?**

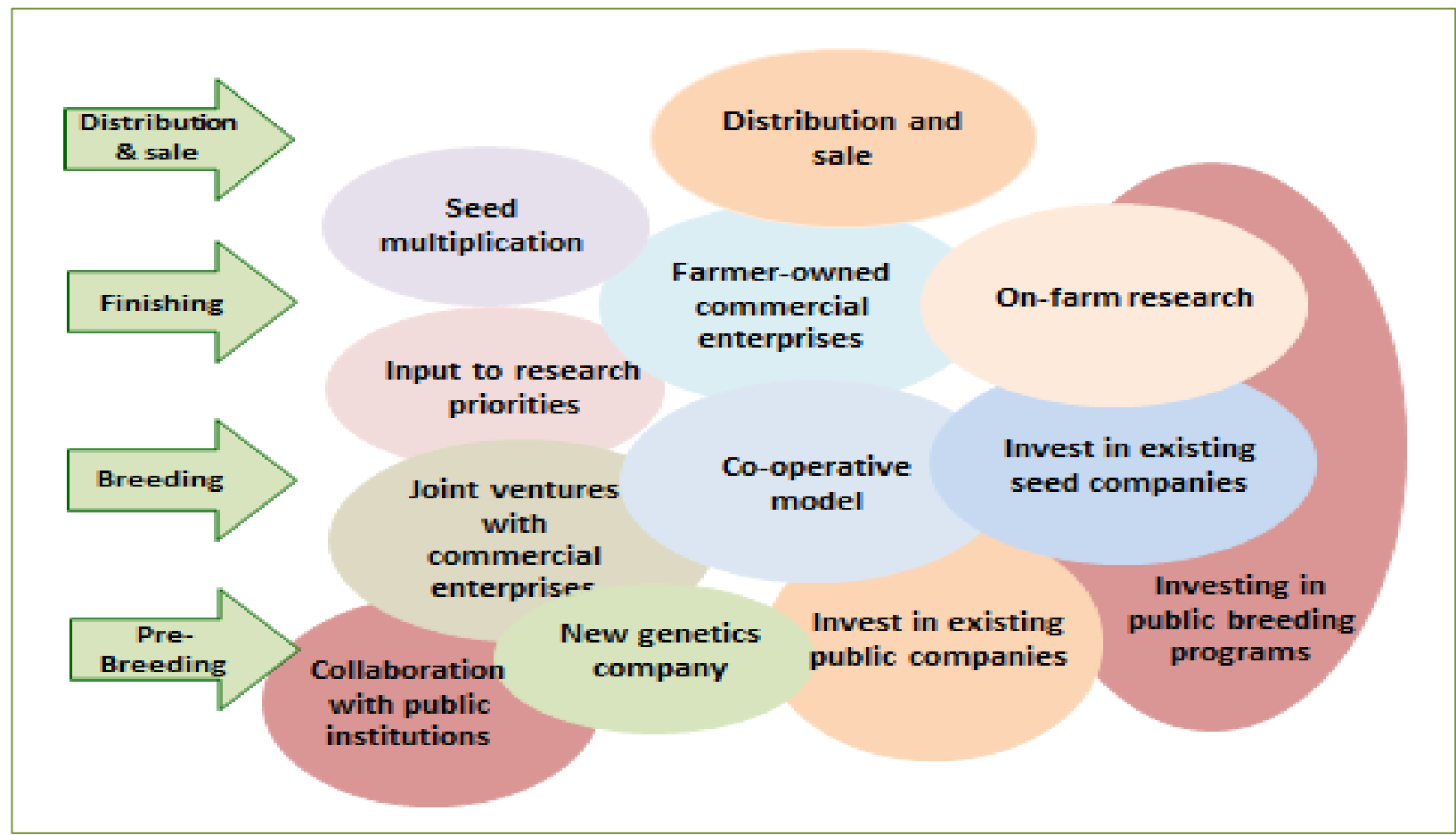
Critical Issues – issues that require resolution.

Developing Potential Producer Involvement Options



An understanding of where we are (and have been) provides a background and context for developing a consensus on where we want to go.

Many Ways to Consider Producer Involvement



Collective producer involvement currently focused on investing in public breeding programs.

Reasons For Exploring Some Options

For Producers Having a Better Understanding of:

- 1. Whether to own and operate a seed company, or whether involvement in variety development is through partnerships and leveraging of funds;**
- 2. Whether to capture royalties on investments producers fund, or whether the payback is through improved varieties for improved on-farm returns;**
- 3. Whether to support an EPR system, or whether variety development should primarily be funded through refundable levies;**
- 4. Whether a more centralized and coordinated approach is required to have an effective approach to maximize the contribution of their provincially based check-off funds that are invested in variety development; and**
- 5. Whether one approach applies to wheat and barley, or whether crop specific approaches may be required (e.g., for barley: feed, food, or malt uses).**

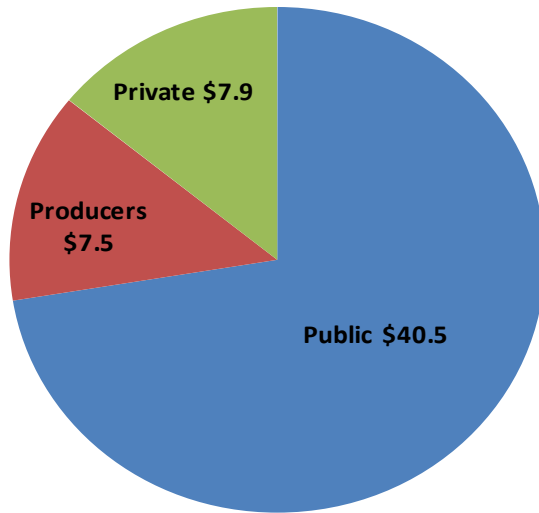
These issues are addressed as we review the business case of the options.

Desired Outcomes

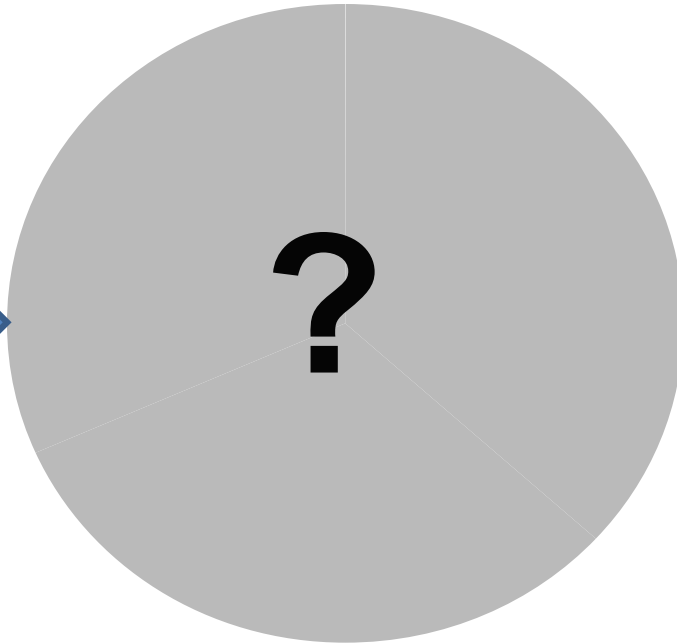
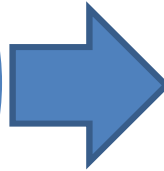
Desired Outcomes

- 1. Enhances wheat and barley competitiveness with other crop kinds;**
- 2. Can provide traits desired by producers (e.g., harvestability and disease control);**
- 3. Can provide attributes for specific markets (e.g., necessary quality standards);**
- 4. Results in higher per acre profits (yields).**

Current and Potential Future Investment



Current Investment of \$56 million



Future Investment of \$??? million

Should a stretch goal be a doubling of investment to be comparable to Australia's annual investment?

What will the distribution of investment between producers, public and private corporate look like with a larger annual investment?

Necessary Conditions

- 1. Must be saleable to producers, affordable and workable within western Canada;**
- 2. Provides traits desired by producers (e.g., disease control) and attributes (e.g., quality parameters) desired in specific markets;**
- 3. Allows for a continuation of the current check-off levy system;**
- 4. Allows for producer leadership and influence; and**
- 5. Is consistent with the need for effective governance and necessary producer control.**

Working Group goal:

“have world class sustainable wheat and barley variety development programs contributing to increased net profitability per acre for Canadian farmers through continual improvement of wheat and barley varieties”

Options Explored Using Five Potential Models

- **Model A - Current Approach with More Coordination and Information Sharing;**
- **Model B - Eight Provincial Commissions involved in Variety Development Research Programs;**
- **Model C - One Non-Profit Producer Body: Wheat and Barley West;**
- **Model D - Australia North: Separate Partnerships for Pre-Breeding and Breeding/Finishing;**
- **Model E - Producer Ownership in a Cereal Breeding Company.**



Options Explored Using Five Potential Models

Where Do We
Want To Go?

Model A:
**More
Collaboration**

Model B:
**Independent
Organizations**

Model C:
**One Formal
Structure**

Model D:
**Australia
North**

Model E:
**Producer
Owned Seed
Corp**

These options were explored without an EPR system, and with an EPR system.

With or Without an EPR System?

Two types of End Point Royalty (EPR) systems:

- 1. Restricted EPR system – where an EPR rate applies only to commercial marketings of varieties released after EPR system is introduced;**
 - The EPR rate can vary by variety
 - 2. Universal EPR system – where a EPR rate applies to all varieties planted and shipped into commercial channels;**
 - A uniform rate applies to all varieties
- ✓ **Current Act only allows for a restricted EPR system**

Why consider supporting an EPR system:

- 1. Provides an incentive for higher level of investment by the private sector;**
- 2. Overall investment level in variety development should increase;**
- 3. Likely only way to achieve a \$100 million (+) goal of annual investment;**
- 4. Can result in more stable investments and no free -riders**

An EPR system would be additional to current check-off levies.

With or Without an EPR System?

	<u>Producer Advantages</u>	<u>Producer Disadvantages</u>
Check-off levies	<ul style="list-style-type: none"> ○ Producer control and influence; ○ Ability to make strategic investments. 	<ul style="list-style-type: none"> ○ Potential insufficient investment; ○ Levy funds can be allocated to competing uses; ○ Levies are refundable.
EPR	<ul style="list-style-type: none"> ○ Creates an additional incentive for private sector investment; ○ Provides a prospective return to the public breeding programs and to producer groups that own varieties. 	<ul style="list-style-type: none"> ○ Less producer control and influence; ○ Amount of producer levy dollars directed to variety development could decrease; ○ Information and germplasm sharing may decrease and affect potential variety improvement; ○ No requirement for EPR's to be invested back into breeding; ○ Small classes underfunded compared to current system; ○ Potentially lower investments in germplasm.

In addition to a check-off levy, an EPR system does have some advantages for producers.

Options Explored Using Five Potential Models

Where Do We
Want To Go?

Model A:
**More
Collaboration**

Model B:
**Independent
Organizations**

Model C:
**One Formal
Structure**

Model D:
**Australia
North**

Model E:
**Producer
Owned Seed
Corp**

These options were explored without an EPR system, and with an EPR system.

Groupings of Assessment Criteria

- 1. Allows for a Robust Variety Development Sector;**
- 2. Allows for Producer Leadership and Influence;**
- 3. Ease of Transition to Proposed Model;**
- 4. Provides Incentives for Investment; and**
- 5. Leads to Desired Outcomes.**

Each of the proposed models were scored using the above.

Specific criteria included within each of these groupings.

- ✓ Provides access to necessary technologies and germplasm;
- ✓ Models must be financially sustainable, secure, and robust;
- ✓ Allows for flexible approaches;
- ✓ Can apply to smaller grain classes and is scalable;
- ✓ Minimizes risk of losing the benefit of past investments;
- ✓ Minimizes risk of the public sector withdrawal from certain stages of variety development;
- ✓ Promotes knowledge sharing/ limited duplication of effort;
- ✓ Does not hinder investment by others;
- ✓ Allows for a mix of private, producer and public breeding;

Above listing includes the specific criteria for this assessment area.

Allows for Producer Leadership and Influence

- ✓ Provides for direction/influence by producers;
- ✓ Enables on-going producer engagement and voice;
- ✓ Promotes producer control;
- ✓ Utilizes effective governance model(s); and
- ✓ Allows for effective partnerships.

Above listing includes the specific criteria for this assessment area.

- ✓ **Leverages existing capacity;**
- ✓ **Is realistic and easy to implement for all participants;**
- ✓ **Is saleable to producers;**
- ✓ **Approach is affordable for producers; and**
- ✓ **Meets federal and provincial government ambitions.**

Above listing includes the specific criteria for this assessment area.

- ✓ **Captures value/royalties for reinvestment – and potential self-funding over time;**
- ✓ **Attracts investments; and**
- ✓ **Promotes a competitive seed market.**

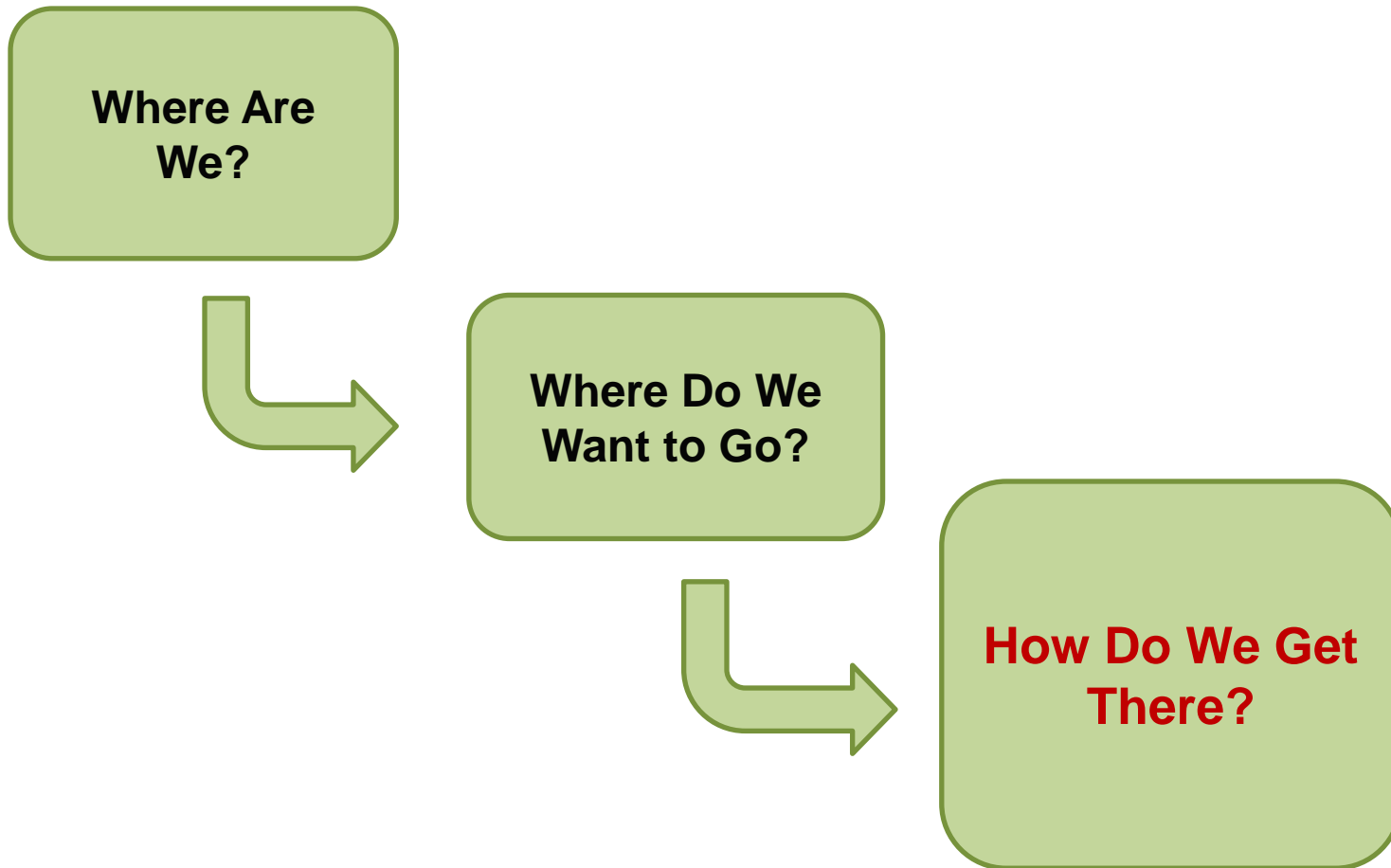
Above listing includes the specific criteria for this assessment area.

Leads to Desired Outcomes

- ✓ **Enhances wheat and barley competitiveness with other crop kinds;**
- ✓ **Can provide traits desired by producers (e.g., harvestability and disease control);**
- ✓ **Can provide attributes for specific markets (e.g., necessary quality standards); and**
- ✓ **Results in higher per acre profits (yields).**

Above listing includes the specific criteria for this assessment area.

Developing Potential Producer Involvement Options



Model options provide choice to producers on how we get to where we want to go.

Governance

- Board appointment - is by producers;
- Advisory body - has producer, public and private sector representation;
- Legal entity - is a non-profit organization;

Assets and Infrastructure Support

- Assets used - is by funding of research contracted out to third parties;
- Management and human capital - is through use of staff and resources provided by WGRF;
- Acquisition of existing organizations - no organizations are acquired;

Operations

- Variety development focus - is on all stages of finishing, breeding, and pre-breeding;
- Partnerships - are with the private sector, universities, and government;
- Training of plant breeders/geneticists - is provided by funding universities;

Coordination

- Coordination between producer organizations - is through a centralized body (e.g.. the WGRF) for decision making and funding of variety development including discovery research, and uses provincial Commissions for local/small class requirements;
- Centralized coordinating body - is the existing organization of the WGRF through the Wheat and Barley Committees;
- Role of Commissions - is to participate in research coordinating body and to fund and coordinate research on behalf of levy payers;

Policy/Regulatory

- End Point Royalty - is not used (as part of the base case);
- Flow of check-off funds - funds remain with the provincial body, and flows to a central body on a case by case basis;

Funding of Operations

- Funding on-going operations - is through use check-off levies and royalty payments;
- Royalty stream - based on licensing of technology and royalties with certified seed sales.

Rationale:

Builds on current level of collaboration and new institutions are not required

Assessment Group Heading	No EPR	Restricted EPR
1 Robust Variety Development Sector	B	B +
2 Allows for Producer Leadership & Influence	A	A
3 Ease of Transition to Proposed Model	A	B
4 Provides Incentives for Investment	C	A -
5 Leads to Desired Outcomes	B -	A -

Risks (with no EPR):

1. *With no EPR sufficient level of investment not attracted;*
2. *Producers are not well positioned if AAFC devotes fewer resources.*

Risks (with an EPR):

1. *Potential loss in producer influence & leadership if check off levies decrease;*
2. *Plant breeders may be less willing to share germplasm.*

Governance

- Board appointment - is by producer elections;
- Advisory body - is composed of only producers;
- Legal entity - is a non-profit organization;

Assets and Infrastructure Support

- Assets used - is by funding of research contracted out to third parties;
- Management and human capital - is through use of internal staff;
- Acquisition of existing organizations - no organizations are acquired;

Operations

- Variety development focus - is on all stages of finishing, breeding, and pre-breeding;
- Partnerships - are with the private sector, universities, and government;
- Training of plant breeders/geneticists - is provided by funding universities;

Coordination

- Coordination between producer organizations - is through a centralized body or network that enables collaboration among provincial Commissions;
- Centralized coordinating body - would be the network of Commissions;
- Role of Commissions - is to fund and coordinate research on behalf of levy payers

Policy/Regulatory

- End Point Royalty - is not used (as part of the base case);
- Flow of check-off funds - funds remaining with a the provincial body, and can flow to a central body on a case by case basis;

Funding of Operations

- Funding on-going operations - is through use check-off levies and royalty payments;
- Royalty stream - is based on licensing of technology and royalties with certified seed sales.

Eight Commissions Involved in Variety Development Research Programs

Model B: Independent Organizations

Rationale:

Provides provincial autonomy and allows producers to direct funds to local needs and classes grown in their region

Assessment Group Heading	No EPR	Restricted EPR
1 Robust Variety Development Sector	B -	B
2 Allows for Producer Leadership & Influence	A	A
3 Ease of Transition to Proposed Model	A	B
4 Provides Incentives for Investment	C	A -
5 Leads to Desired Outcomes	B --	A --

Risks (with no EPR):

1. *With no EPR sufficient level of investment not attracted;*
2. *Producers are not well positioned if AAFC devotes fewer resources;*
3. *Potentially higher administration cost and duplication with fewer strategic investments;*
4. *Producer voice may become fragmented.*

Risks (with an EPR):

1. *Potential loss in producer influence & leadership if check off levies decrease;*
2. *Plant breeders may be less willing to share germplasm.*

Governance

- Board appointment - is by producers;
- Advisory body - is composed of only producers, but could include the public and private sector representatives;
- Legal entity - is a non-profit organization – can include a JV between the Commissions;

Assets and Infrastructure Support

- Assets used - is by funding of research contracted out to third parties;
- Management and human capital - is through hiring of necessary internal staff; however this could be provided by a third party (e.g., WGRF);
- Acquisition of existing organizations - no organizations are acquired;

Operations

- Variety development focus - is on all stages of finishing, breeding, and pre-breeding;
- Partnerships are with the private sector, universities, and government;
- Training of plant breeders/geneticists - is provided by funding universities;

Coordination

- Coordination between producer organizations - is through a centralized body (WBW) for decision making and funding of variety development;
- Centralized coordinating body - is the new organization WBW;
- Role of Commissions - is to forward check-off funds ear-marked for variety development to WBW and to have representation in the research coordinating body (of WBW);

Policy/Regulatory

- End Point Royalty - is not used (as part of the base case);
- Flow of check-off funds - funds flows to the central body (WBW);

Funding of Operations

- Start-up funding - is through use of check-off levies;
- Funding on-going operations - is through use check-off levies and royalty payments;
- Royalty stream - is based on licensing of technology and royalties with certified seed sales.

Rationale:

Efficiencies, scale economies, and avoidance of duplication with one structure, and allows for larger one-time strategic investments

Assessment Group Heading	No EPR	Restricted EPR
1 Robust Variety Development Sector	A -	A
2 Allows for Producer Leadership & Influence	A	A
3 Ease of Transition to Proposed Model	A	B
4 Provides Incentives for Investment	C	A -
5 Leads to Desired Outcomes	B	A

Risks (with no EPR):

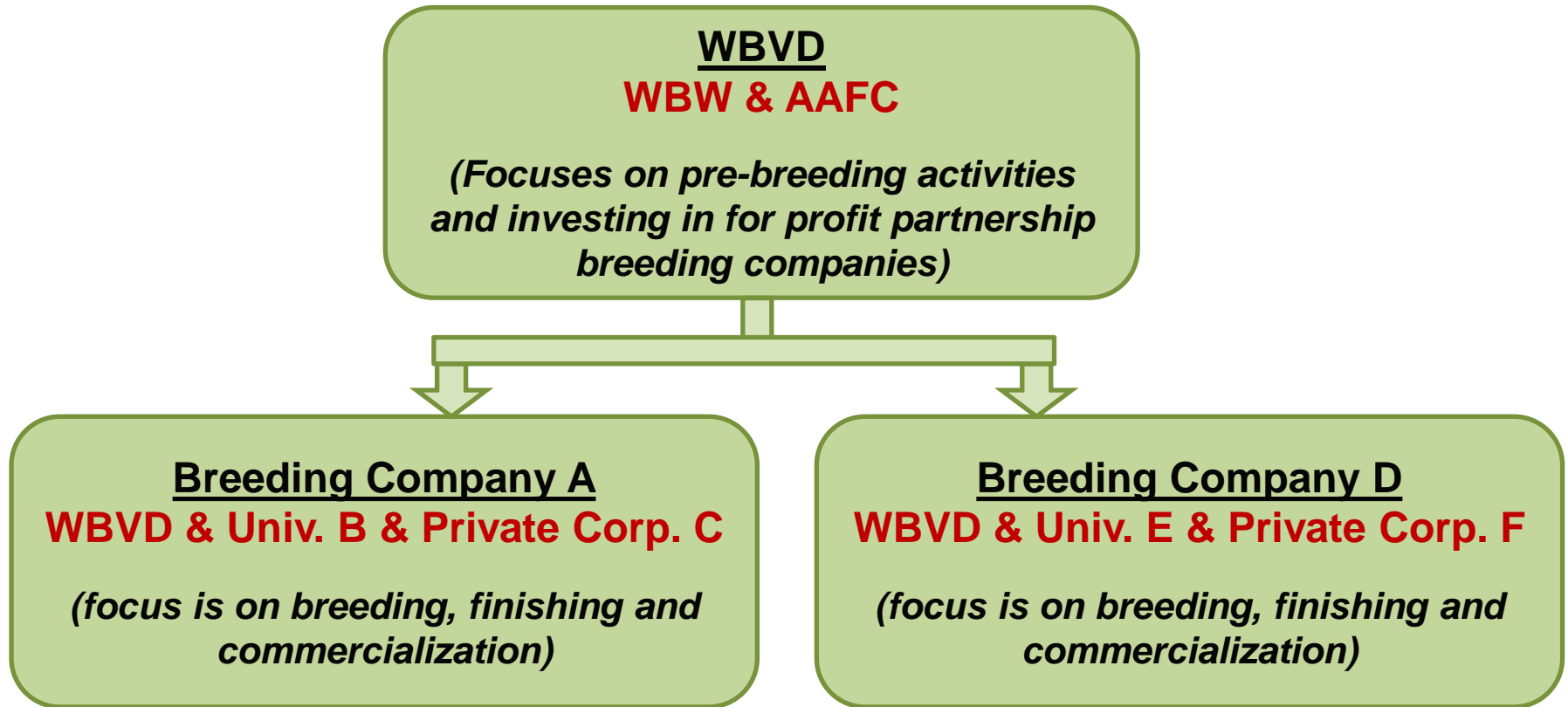
1. *With no EPR sufficient level of investment not attracted;*
2. *May not result in being competitive with other crop kinds;*
3. *Potential for some governance issues with certain groups being more dominant.*

Risks (with an EPR):

1. *Potential loss in producer influence & leadership if check off levies decrease;*
2. *Plant breeders may be less willing to share germplasm.*

Australia North: Separate Partnerships for Pre-Breeding and Breeding/Finishing

Model D:
Australia
North



Australia North: Separate Partnerships for Pre-Breeding and Breeding/Finishing – Part 1: Discovery Research at WBVD

Model D: Australia North

Governance

- Board appointment - is by government and producers;
- Advisory body - is composed of only producers, but could include the public and private sector representatives;
- Legal entity - is a non-profit organization;

Assets and Infrastructure Support

- Assets used - is by funding of research contracted out to third parties;
- Management and human capital - is through hiring of necessary internal staff at WBVD; and this could be provided by a third party;
- Acquisition of existing organizations - no organizations are acquired;

Operations

- Variety development focus - is primarily on pre-breeding (discovery research);
- Partnerships - are with the universities, and government;
- Training of plant breeders/geneticists - is provided by funding universities;

Coordination

- Coordination between producer organizations - is through the centralized body (WBVD) for decision making and funding of variety development;
- Centralized coordinating body - is the new organization WBVD;
- Role of Commissions - is to forward check-off funds ear-marked for variety development to WBVD and to have representation in the research coordinating body (of WBVD);

Policy/Regulatory

- End Point Royalty - is used and applies only to varieties released after necessary regulatory change; however, this is not a significant revenue source for WBVD unless WBVD owns some varieties with revenues based on licensed technologies paid by through EPRs;
- Flow of check-off funds - ear-marked funds for variety development flow to the central body (WBVD);

Funding of Operations

- Start-up funding for the central body WBVD - is through use of check-off levies and government funds;
- Funding on-going operations - is through use check-off levies, royalty payments and government funds (linked to levies collected);
- Royalty stream - is based on licensing of technology and royalties associated with seed varieties that were funded through WBVD participation in breeding partnerships.

Australia North: Separate Partnerships for Pre-Breeding and Breeding/Finishing – Part 2: P4 Partnership Breeding Companies

Model D: Australia North

Governance

- Board appointment - is by the shareholders;
- Advisory body - is composed of only producers and private sector representatives;
- Legal entity - is a for-profit organization;

Assets and Infrastructure Support

- Assets used - are in-house research capacity based on ownership and operation of a seed/genetics company;
- Management and human capital - is through internal staff;
- Acquisition of existing organizations - the partnerships acquire public assets and as well partner with public organizations (e.g., universities);

Operations

- Variety development focus - is on the stages of breeding, finishing, and commercialization;
- Partnerships - are with the private sector, and universities;
- Training of plant breeders/geneticists - is based on partnerships with universities;

Coordination

- Coordination between producer organizations - is through the centralized body (WBVD);

Policy/Regulatory

- End Point Royalty - is used and applies only to varieties released after necessary regulatory change;
- EPR and industry goods - a portion of the EPR flows to WBVD to fund discovery research, as well as any licensed technology and associated royalties that are paid to WBVD (funded by EPRs collected);
- Flow of check-off funds - funds flow only to the central body (WBVD);

Funding of Operations

- Start-up funding - is through funds invested by WBVD and other partners
- Funding on-going operations - is through a large portion of EPRs collected on varieties released by the partnerships;
- Royalty stream - is based on EPRs collected on certified seed sales and FSS for varieties released by the partnerships.

Australia North: Separate Partnerships for Pre-Breeding and Breeding/Finishing

**Model D:
Australia
North**

Rationale:

This model is used in Australia and its success could be replicated on the prairies

Assessment Group Heading	No EPR	Restricted EPR
1 Robust Variety Development Sector	C	B -
2 Allows for Producer Leadership & Influence	B	B
3 Ease of Transition to Proposed Model	C	C-
4 Provides Incentives for Investment	C	A -
5 Leads to Desired Outcomes	C	B

Risks (with an EPR):

1. *Model failure due to amount of transition required;*
2. *Can create uncertainties for stakeholders – transfer of public sector employees & assets;*
3. *Reduction in overall public sector support/investment;*
4. *Smaller acreage classes receive less attention - arising from for-profit orientation;*
5. *Loss of producer leadership and influence.*

Risks (with no EPR):

1. *Few if any breeding partnerships and ability to attract additional investments.*

Producer Ownership in a Cereal Breeding Company

Model E: Producer Owned Seed Corp

Governance

- Board appointment - is by the shareholders, which include individual producers;
- Advisory body - is composed of only producers and private sector representatives as required;
- Legal entity - Seed Corp is a for-profit organization, all levy contributors become shareholders;

Assets and Infrastructure Support

- Assets used - are in-house research capacity based on ownership and operation of Seed Corp, as well as through partnerships;
- Management and human capital - is through Seed Corp's internal staff;
- Acquisition of existing organizations - the company can acquire a seed company or build a seed company, and can include partnerships/joint ventures;

Operations

- Variety development focus - is on the stages of breeding, finishing, and commercialization;
- Partnerships - can be with the private sector, universities, and government;
- Training of plant breeders/geneticists - based on providing project funding to universities;

Coordination

- Coordination between producer organizations - is through a centralized body such as WGRF, which may or may not be a shareholder in Seed Corp;
- Centralized coordinating body - is Seed Corp for variety development;
- Role of Commissions - is to participate in the research coordinating body and to forward check-off funds to Seed Corp;

Policy/Regulatory

- End Point Royalty - is not used (as part of the base case);
- Flow of check-off funds - an ear-marked portion is transferred to Seed Corp;

Funding of Operations

- Start-up funding - is through levy funds;
- Funding on-going operations - is through check-off levies and royalty payments and license fees;
- Royalty stream - is based on licensing of technologies and royalties on certified seed sales and end use agreements.

Producer Ownership in a Cereal Breeding Company

**Model E:
Producer
Owned Seed
Corp**

Rationale:

Allows producers to own a for-profit wheat and barley breeding company

Assessment Group Heading	No EPR	Restricted EPR
1 Robust Variety Development Sector	C -	C
2 Allows for Producer Leadership & Influence	A	A
3 Ease of Transition to Proposed Model	B -	B
4 Provides Incentives for Investment	C	A -
5 Leads to Desired Outcomes	C	B

Risks (with no EPR):

1. *Does not allow for a mix of private, producer and public investments;*
2. *Benefit of past Investments may be lost;*
3. *Loss of public investment in variety development due to fewer producer dollars leveraging public investments;*
4. *Bankruptcy due to insufficient producer funding through ear-marked levies;*
5. *Ability to attract necessary talent and relationship with public breeders;*
6. *Not producing successful varieties.*

Risks (with an EPR):

1. *Ability to compete with established seed companies.*

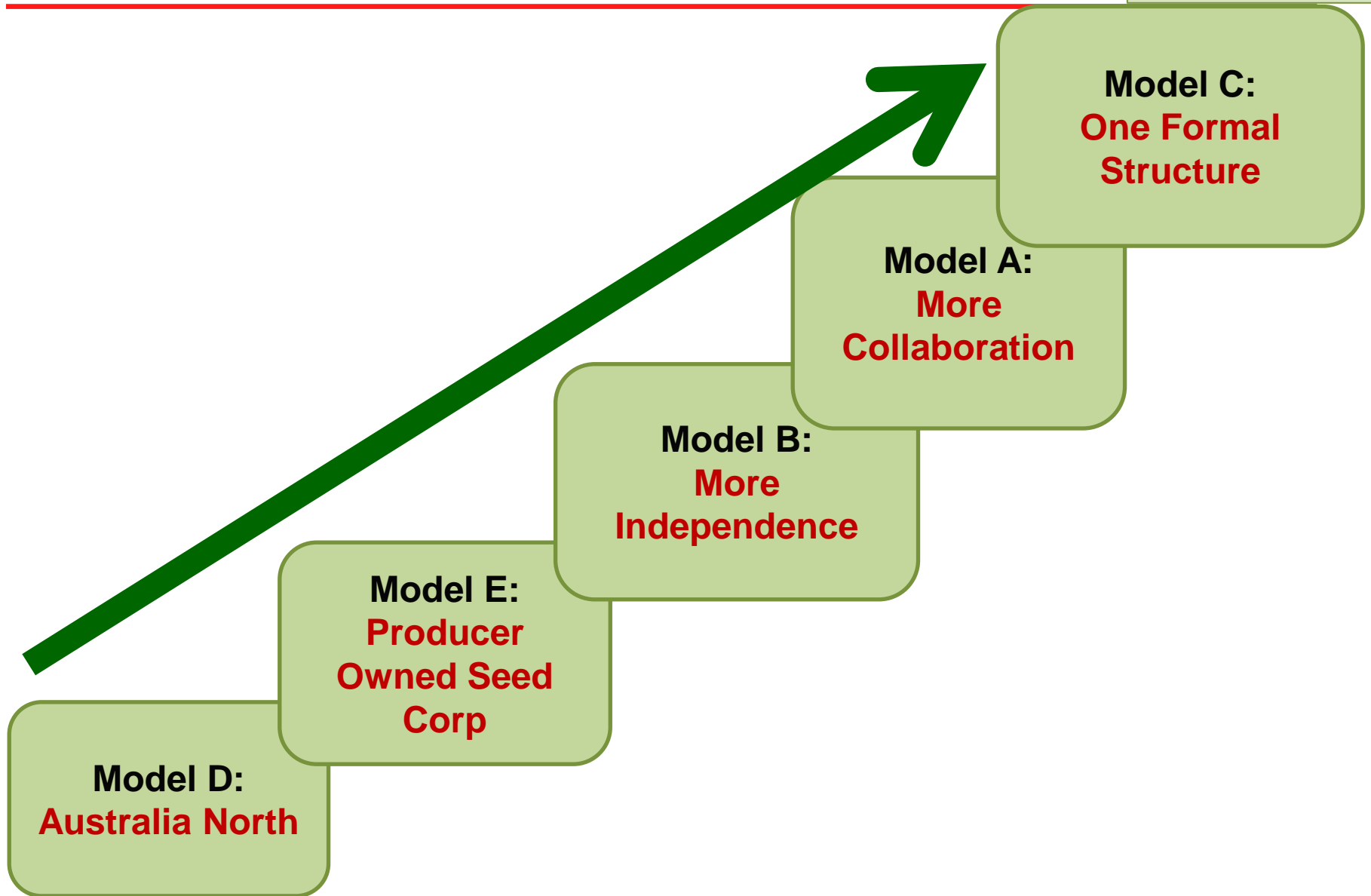
Ranking of the Five Producer Involvement Options

Model		1 Robust Variety Development Sector	2 Allows for Producer Leadership & Influence	2 Ease of Transition to Proposed Model	4 Provides Incentives for Investment	5 Leads to Desired Outcomes
A - Current Approach with More Coordination & Information Sharing	no EPR	B	A	A	C	B -
	restrictive EPR	B +	A	B	A -	A -
B - Eight Provincial Commissions Involved in Variety Development Research	no EPR	B	A	A	C	B --
	restrictive EPR	B +	A	B	A -	A --
C - One Non-Profit Producer Body: Wheat and Barley West	no EPR	A -	A	A	C	B
	restrictive EPR	A	A	B	A -	A
D - Australia North - Separate Partnerships for Pre-Breeding and Breeding/Finishing	no EPR	C	B	C	C	C
	restrictive EPR	B -	B	C -	A -	B
E - Producer Ownership in a Cereal Breeding Company	no EPR	C -	A	B -	C	C
	restrictive EPR	C	A	B	A -	B

The areas highlighted in green indicate which option scores the highest by assessment area.

Consultants' Ranking of Options

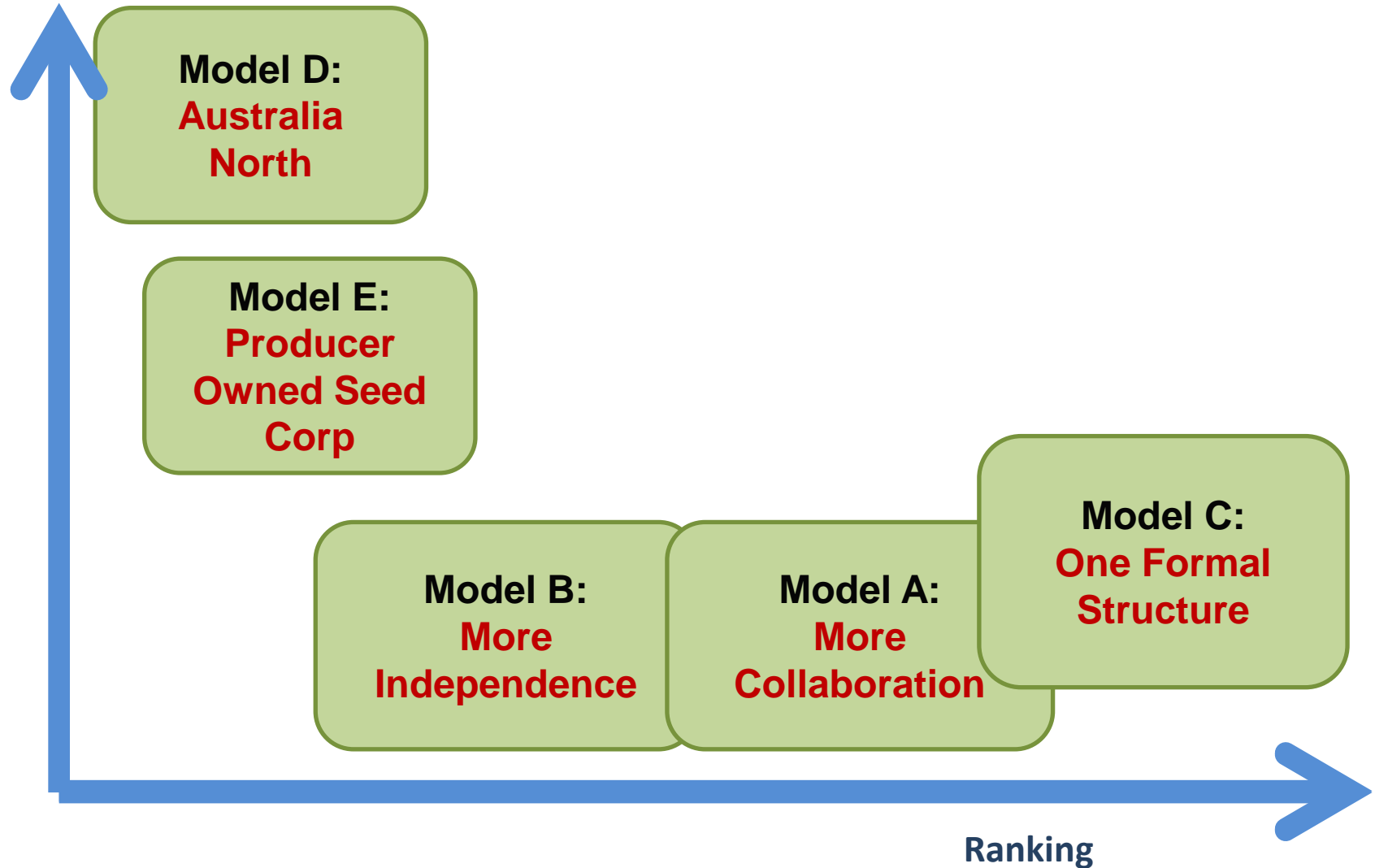
How Do We Get There?



Ranking and Degree of Change Required

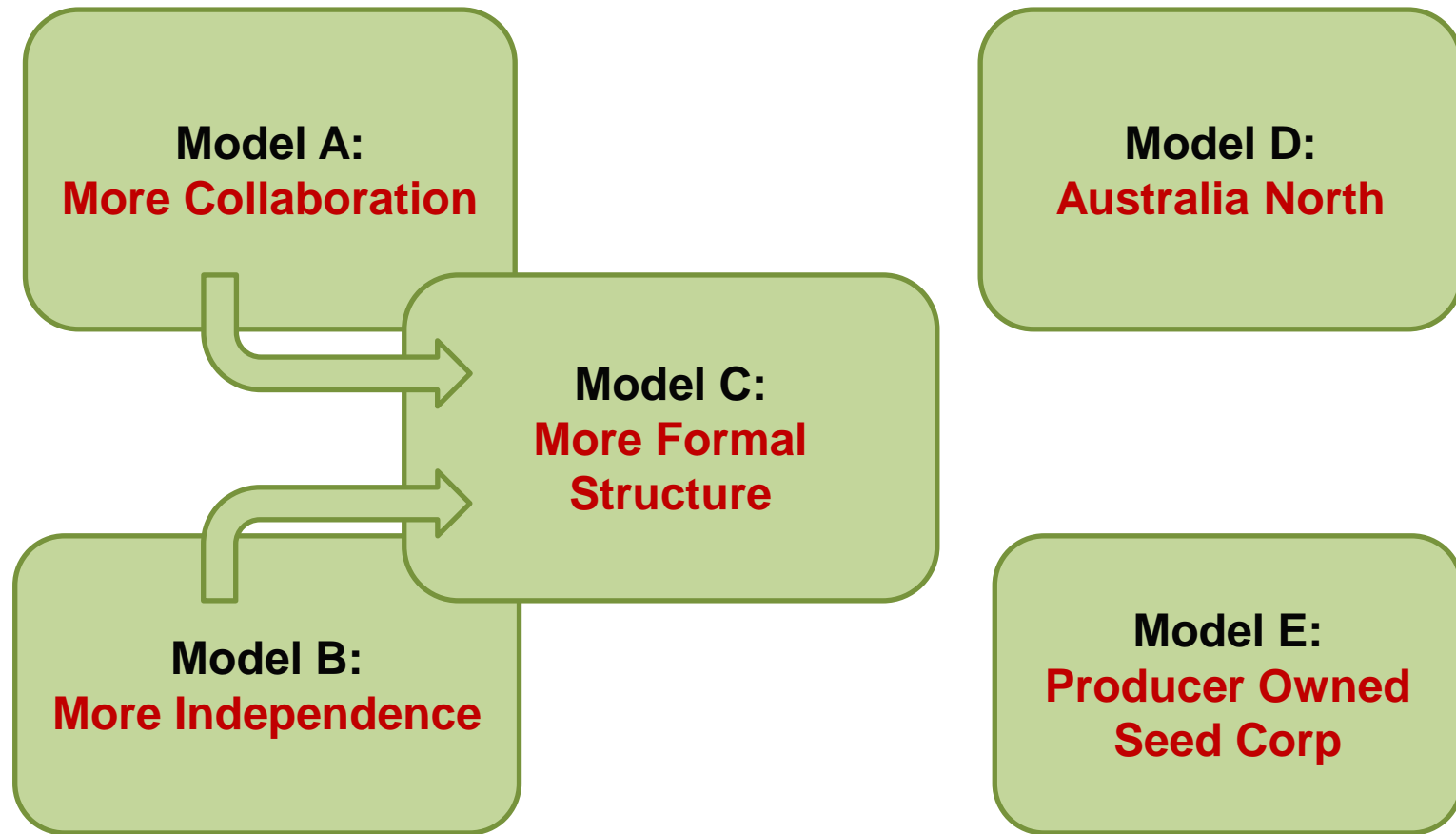
How Do We Get There?

Degree of Change



Options Explored Using Five Potential Models

How Do We Get There?



Revisiting Five Issues Noted Earlier

1. Whether to own and operate a seed company, or whether involvement in variety development is through partnerships and leveraging of funds;
 - ✓ Producers can have leadership and influence through partnerships and leveraging of funds;
 - ✓ Owning a seed company involves considerably more risks and few benefits;
2. Whether to capture royalties on investments they fund, or whether the payback is through improved varieties for improved on-farm returns;
 - ✓ Producers capture some value each year through new successful varieties;
 - ✓ Producers also capture value through royalties through investments in technologies and varieties;

Revisiting Five Issues Noted Earlier

3. Whether to support an EPR system, or whether variety development should primarily be funded through refundable levies;
 - ✓ An EPR system provides an incentive for investment by for-profit breeders and offers the highest potential for investment in variety development;
 - ✓ A levy system that supports variety development funding should continue, even with an EPR because it enables producer leadership and voice;
 - ✓ Making part of the levy non-refundable and dedicated to varietal development may optimize the co-existence of EPRs and levies;
 - ✓ Without an EPR, check-off levies earmarked for variety development would need to increase by \$1.50/tonne for wheat and barley (based on the need for an additional \$44 million of annual producer contribution and reach stretch goal of \$110 million per annum);

Revisiting Five Issues Noted Earlier

4. Whether a more centralized and coordinated approach is required to have an effective approach to maximize the contribution of their provincially based check-off funds that are invested in variety development;
 - ✓ A more formal structure provides for scale economies, consolidated producer voice, and more focused strategic investments;
5. Whether one approach applies to wheat and barley, or whether crop specific approaches may be required (e.g., for barley: feed, food, or malt uses);
 - ✓ One approach such as a prairie wide seed company can result in less attention and investment in certain classes of wheat and barley;
 - ✓ Necessary flexibility can be achieved through models where producers have the influence to invest in priority areas for producers, (such as in Models A through C).

Choices Facing Producers

How Do We Get
There?

- 1. How should producers be involved in variety development?**
- 2. Whether producers should support an EPR System?**

Producer Involvement in Variety Development

- 1. Thank you for allowing us to work with you on this project;**
- 2. We appreciate the Working Group's input and engagement on this project.**