A BALANCING ACT

Optimizing Payment Schedules in Environmental Pay for Success Contracts

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ABOUT

Housed within the Environmental Policy Innovation Center (EPIC), the Restoration Economy Center envisions a world where environmental restoration outpaces environmental impacts. We champion pathways to achieving greatly scaled environmental restoration outcomes.

The mission of EPIC is to build policies that deliver spectacular improvement in the speed and scale of conservation. We focus on a narrow set of strategies:

- Improving policies that allow private sector funding or stewardship to expand or supplant public or charitable conservation work
- Transforming government policies to focus on what matters— outcomes
- Eliminating the organizational barriers that prevent public agencies from adapting to 21st-century solutions

We believe that innovation and speed are central to broadening efforts to conserve wildlife, to restore special natural places, and to deliver to people and nature with the clean water they need to thrive. To achieve those goals, conservation programs must evolve to accommodate our modern understanding of human behavior and incentives and the challenges posed by humanity's expanding footprint. We embrace experimentation with novel ideas in conservation policy, to learn quickly from mistakes and iteratively design effective approaches to be even more successful.

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EXECUTIVE SUMMARY

Pay for Success contracts are becoming increasingly common for environmentally beneficial projects. We applaud their use for these purposes; however, proper implementation is key to realizing the many benefits contract structures can provide. We have been tracking and analyzing emerging Pay for Success programs throughout the country, and have found that the contract's payment schedule (also known as payment triggers or payment milestones) can strongly impact a program's success.

This paper provides an overview of three real Pay for Success programs in existence in the United States, all with drastically different payment schedules. We standardize these examples and use financial models to illustrate the importance of using a proper payment schedule.

> *Based on our analyses and knowledge of existing programs, we recommend a payment schedule that provides approximately 40-60% at the time construction is completed, reserving the remaining 40-60% for after desired outcomes are achieved.*

We then make the following recommendations for government agencies who are designing Pay for Success programs. Elaboration on all can be found on page 19, Recommendations.

For Government Agencies:

1. **Balance risk and the value of a dollar.**
2. **High bonding requirements or onerous financial assurances are no longer needed.**
3. **Allow for flexibility.**

For Legislators:

1. **Ensure that authorizing legislation clarifies that Pay for Success programs include flexibility in payment schedules.**
2. **Do not include onerous financial assurances and/or bonding requirements in legislation.**

For Investors:

1. **Provide feedback to legislators regarding program design elements that contribute to higher or lower investment risk.**
2. **Seek opportunities to learn.**

INTRODUCTION

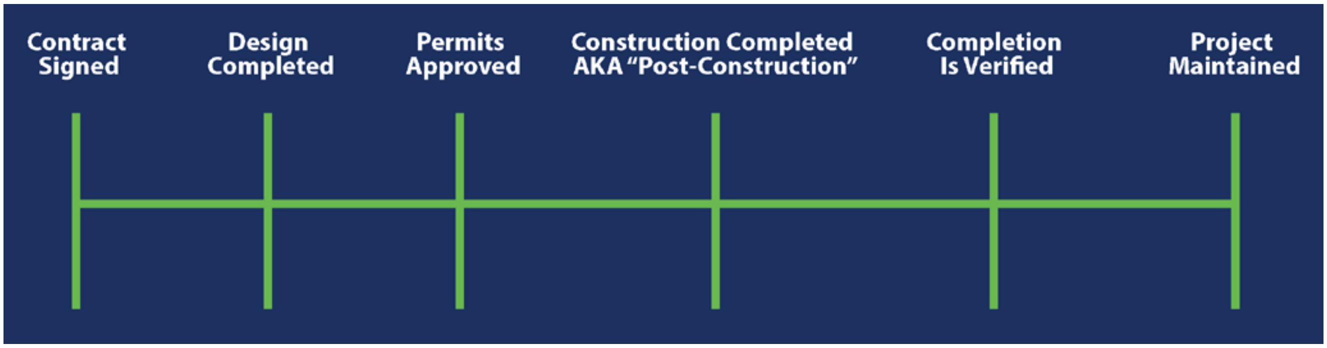
Over the last few years, Pay for Success contracting for environmental outcomes has become more and more prevalent throughout the United States. Local and state governments specifically have taken the leap to reap the rewards that come with alternative procurement methods. With this increase in usage, we can now evaluate the nuances of variation in contract structure within the PFS scheme.

As momentum has built, we've been looking at real-world examples of Pay for Success Request for Proposals (RFPs) and contracts to draw some important conclusions about what works and what doesn't–or just what could work better. We are at an inflection point in how environmental outcomes are paid for. It's important to reflect and iterate on program design as we gather more and more information about Pay for Success in the real world.

Our goal is to set Pay for Success programs up for…well…success. A core element of Pay for Success contracts that we've seen span a wide spectrum is how payment schedules are structured.

Pay for Success touts the idea that the payor, usually a government entity, doesn't pay the contractor for their work until they've successfully completed the job. This is true, we've said the same thing ourselves. In reality, we see a huge variety in when, and what percentage, of the payment is issued. Some programs claim to use Pay for Success while paying almost the entire project by post-construction[1]. Others will pay 5% of the total contract every year for 20 years. There's also a ton of variety in between.

It's important to understand the lifecycle of the types of projects we're talking about. Generally speaking, they follow the following steps. Please note that the spacing between project steps is not scaled to the amount of time it takes between each step.



So what makes a good payment schedule? Why is this important? What are the consequences of various payment schedules? This paper ties together real-world examples with financial modeling that can explain the discrepancies in results between different payment schedules.

Understanding that certain project types or geographies may call for individualized structures, we make the case for an optimal payment schedule and provide recommendations on how to design payments that work for your program.

Throughout this paper, we will feature three real programs that all use different payment schedules to showcase the variety of implementation and use a traditional grant agreement as a control comparison.

Example 1) The Frontloaders: ~80% Post-Construction
A county in the Northeast corridor is urbanizing and suburbanizing which creates increasing pressure on the county to meet its stormwater management goals. They adopted a Pay for Success approach early on and started issuing an annual request for proposals for contracts that pay based on the number of impervious acre credits delivered. This

1. For the purposes of this paper, we define "post-construction" as the point at which a restoration project's construction or physical improvements have been completed. This includes all activities from tree plantings, which may seem relatively non-invasive, to large-scale landscape reconstruction.

program has been around now for over five years, and the total cost-savings of this program, compared to its previous traditional procurement, is roughly 80% with clear success in delivering agreed-upon water quality outcomes.

This county's payment schedule varies slightly from project to project. However, generally speaking, around 80% of the total project costs are paid out at or before construction is completed.

Example 2) The Many Milestones: ~60% Post-Construction
A state water resource agency has used Pay for Success to undergo large-scale habitat restoration and flood improvement projects. This effort provides the state with habitat credits to help them meet the requirements of an Endangered Species Act biological opinion.

These projects are broken up into small parts, similar to the timeline image above, called milestones. When a milestone is met, a certain percentage of the project costs are triggered. Example 1 uses this approach too, but not to the same extent this agency does.

If we total up the payment milestones in this project, roughly 60% of the money is paid by the time construction is completed.

Example 3) The Holdouts: 100% Upon Verification
An East Coast state established a $20 million a year purchasing program to buy cost-effective nitrogen reduction outcomes, including from projects on farms. Their first application period closed in September 2022, and they received applications for almost five times the amount of money available, most at a significantly lower cost than traditional contracting.

Originally, the state agency allowed applicants to submit their own payment schedule with their proposal. However, after signing contracts with awardees, they are now requiring all projects to adhere to an annual payment schedule that only pays for outcomes that are modeled to occur in that year. Since all contracts are for 10-20 years, this means contractors only receive 5-10% of the total payment each year.

Control) A Traditional Grant Agreement
For our financial modeling, we're using a traditional grant agreement as a control to compare these Pay for Success payment schedules against. While there is also variation in how grant programs are administered, for the purposes of this paper, this grant will award all funds upfront.

Summary of Pay for Success Payment Schedule Examples

	% paid by post-construction	% held for verified delivery of outcomes	Outcome purchased	Est. time to final payment
Ex) 1 The Frontloaders	~ 80% Individual projects vary	~20% Individual projects vary	Stormwater Credits	8 years
Ex) 2 The Many Milestones	~60%	~40%	Habitat Credits	Est. 5 years
Ex) 3 The Holdouts	0%	100%	Lbs. of Nitrogen	The lifetime of BMP (up to 20 years)
Control) Grants	100% paid upon agreement execution (pre-construction)	0%	n/a	0 years - paid upon agreement execution

We will use these four examples to explore the issues and benefits of each approach and use financial models to explore how each payment schedule impacts the actualized costs of the project.

WHAT IS THE IDEAL PAYMENT SCHEME FOR A PFS CONTRACT?

An ideal payment scheme should balance at least three considerations: risk, cost, and inclusion[2].

One could imagine a contract that bases the total amount of compensation on a dollar-per-outcome metric but that delivers all of that funding as soon as that contract is awarded–this is basically our control. That's even more up-front than what we've previously called "front-loaded," the amount delivered at construction. Many organizations would be excited about this, would have no financing costs, and could use government-provided capital to finance other projects or even make loans. These would all drive down the apparent price of the outcomes. But at what cost?

In that scenario, governments bear all of the risk of the project failing, thus they'd want to be very involved. Maybe they'd want to check timesheets; maybe they'd want to select the sites. All of this would drive up costs and would very quickly kill most of the point of paying for outcomes. The flexibility afforded to contractors by Pay for Success is one of the main drivers of cost savings. And the apparent cost savings may be lost when factoring in that a certain percentage of projects will fail completely and all of the funds expended would be lost.

On the other end of the spectrum, in our "holdouts" example, the government pays a flat amount each year for the outcomes that have been verified as delivered that year, with no intermediate milestone payments. This makes complete sense for a project with relatively low up-front costs and that relies on taking approximately the same action each year, for instance planting cover crops. However, it has a distinct disadvantage for more capital-intensive projects: cost.

The benefit of the holdouts approach is that governments bear next to no risk. This allows them to forego what can be burdensome requirements on applicants like financial assurances and bonding. That can slightly offset higher costs otherwise created by this approach. And it may bring more applicants to a market, increasing inclusion.

To optimize the balance between these two competing factors, **the payments should be tied to the amount of risk.** As the risk of outcomes not being achieved decreases (by milestones being met, measurements being recorded, etc.), more of the funds can be released to an applicant. But how can a program administrator know the risk of a project failing at any given point in the project? If they knew it exactly, there would be no risk. They have to make a best guess based on previous experience.

2. Image by upklyak on Freepik

WHAT IS RISK?
Risk is not just of the project failing but of other, better uses for the funds, also known as the opportunity cost. Risk is directly tied to the time value of money–the concept that a dollar today is worth more than a dollar a year from now. The rate which is used to calculate how much less funds are worth a year in the future when compared to today is called the discount rate. Governments apply that discount rate when comparing the implementation of policy objectives or capital projects and the most beneficial use of those funds over the project time horizon.

Government-funded projects have inherently less risk from a discounting perspective due to the lower cost of capital for governmental bodies. For instance, government generally has access to tax-exempt bond proceeds and other lower-interest debt instruments than private equity financing organizations. Additionally, public funds also by law are generally required to be placed in safer and more risk-averse investments, such as treasury bonds, high-grade municipal bond funds, stable net asset value (NAV) investment pools, or money market accounts. Private equity, conversely, has the ability for significantly higher returns but at much greater risk. Thus, present value discounting for government projects should always be discounted at a lower rate than private equity due to lower investment risk and cost of capital.

Governmental entities also have different potential revenue streams that are not available to the private sector, such as the ability to levy taxes and assess special fees and rates for public utilities. These revenue sources create very stable and low-risk revenue streams to support payment of contracts and issuance of municipal debt. The question then becomes: how can PFS contracting models balance efficient deployment of low-cost capital for projects while also mitigating the risk of not meeting project milestones in the event the project fails?

Looking at successful and failed programs across the country, we've found the appropriate percentage range delivered by the time[3] construction is complete falls between 40-60%. This is more of a result of trial and error than of a formula. Our experience shows that this figure is enough that the present value of the dollar is still high enough to keep costs low while holding enough to manage risk by ensuring accountability.

Looking at successful and failed programs across the country, we've found the appropriate percentage range delivered by the time construction is complete falls between 40-60%.

One other consideration to make is that not all potential applicants will have the same level of access to capital. In some situations, it may make sense to provide funds totally up front or to increase the amount delivered at construction for particular kinds of applicants like minority business enterprises. While this is outside of the risk/cost dichotomy, states have already demonstrated a desire in other kinds of programs to provide this leg up in pursuit of a more equal society.

3. It's important to note that when we say "percent paid up through post-construction," or "by post-construction" we don't necessarily mean one lump sum payment at the time construction is finished. In certain situations, it is appropriate to break this up into smaller payments that are triggered when value is transferred to the buyer and represent big inflection points in the project lifecycle. This includes milestones like when land acquisition. Additionally, project size is important to consider. Projects on the order of tens or hundreds of millions of dollars warrant breaking up payments tied to this value transfer, while projects on the order of $1-5M are easier to finance. Our recommendation stands regardless: that when all of these early payments are added together, that total should still not exceed 40-60% of the total contract.

FINANCIAL MODELING

Each of the scenarios outlined above are real Pay for Success projects in the United States. Because of this, each has different regulatory drivers, vastly different locations, differing underpinning state and local laws, and other nuanced differences. To truly make apples-to-apples comparisons for the illustrative purpose of this paper, we are simplifying them even further. We have made a few underlying assumptions on total contract value, total target return from attributes credits or outcomes-related proceeds, and timeframe for repayment of credit revenues. These efforts to standardize our models are noted where applicable.

Let's take a look at each of our three Pay for Success contract scenarios to further demonstrate the time-value of money. As we mentioned in the last section, the value of the dollar diminishes each year by a predetermined rate known as the discount factor. The purpose of discounting is to determine the present value of a set of funds or stream of income measured at some point in the future. This exercise is critical when performing cost-benefit or cost-effectiveness analyses when evaluating the best course of action for the development of policy or a large-scale capital project. The discount factor is a percentage of economic risk to be applied to a future stream of income to demonstrate a future value of money as if it were today's dollars. Again, put simply - a dollar today is worth more than that same dollar tomorrow due to this principle.

WHAT ELSE IS BUNDLED IN BID PRICING?
Along with the costs of a project and profit margin, bid prices, regardless of procurement method, also include other risk management factors like cost of general liability insurance and/or performance bonds, contingencies and allowances, and the cost of capital for bridge financing if a contractor needs additional cash flows to in.

The discount factor also should not be confused with the inflation rate. While inflation is a measure of the increase in the cost of goods and services when compared with past values, discounting is forward-looking and reflects economic or opportunity risk based upon an appropriate factor. A simple way to think of the discount factor is the rate of return that you could otherwise reasonably expect to earn on an annual basis from investing those present dollars. Private-sector entities may use a 7%, 10%, or higher discount factor in some instances (especially venture capital or private equity, which may exceed a 20% discount factor for higher-risk projects). With greater financial risk also comes the opportunity for greater returns with private equity-financed projects. However, as we discussed previously, public funds have generally much lower financing costs, and legal requirements for stable investment vehicles in government lead to safer but lower returns than the private sector.

The 3% discount factor is a well-established rate for public sector cost-benefit accounting. Since 3% is a widely utilized rate of return for the average investor after payment of taxes, also known as the 'consumption rate[4], generally most analysts will view public policies or projects that do not meet or exceed a 3% return as an unfavorable outcome for taxpayer dollars. For purposes of this exercise, we have used the 3% discount factor.

For each of the three Pay for Success scenarios, we have assumed a total base contract value of $1,000,000. The quantifiable benefits in this analysis, which are the income stream from the issuance of verified environmental attribute credits, assume a 40% return on the base contract value of the government's investment in environmental outcomes. To account for the contractor's fluctuations in bid pricing depending on the PFS model and risk of non-payment from project failure, we assume a 5%-40% range of contingency allowance for each scenario. These adjustments to the bid from the base contract price reflect a greater contingency in PFS models with less up-front government capital and longer project verification and payment timelines. The environmental outcomes themselves are also obviously a significant benefit not reflected in the numerical analysis. The formula used to calculate the present value is as follows:

4. U.S. Environmental Protection Agency, Guidelines for Preparing Economic Analyses, 2010. 6-6, https://www.epa.gov/sites/default/files/2017-09/documents/ee-0568-06.pdf.

PV = nb1/(1+r)^1+nbk/(1+r)^k

PV = Present Value
nb= net benefit
r = discount factor

We also have captured the remaining risk of the government's investment in the contract on an annual basis and compared it to the cumulative present value of benefits received from the project's revenue streams. In each of the three scenarios, we will evaluate the total present value of benefits received, total net benefit, remaining contract risk, and annual ratio of present value benefits to future value remaining risk (benefits divided by remaining contract risk).

Example 1 - The Frontloaders

- $1,000,000 total base project cost
- 80% paid post-construction (base year + 1, or BY+1), the remainder in two lump sum payments (at verification and again post-maintenance)
- Assume 10% contingency added in bid price ($1,110,000 total contract cost)
- Final construction contract payment in eight years (BY+8)
- Proceeds from credits paid out in five-year period post-construction

Ten-Year Cost Benefit Analysis	
Total PV Benefits	**$1,244,968.94**
Total PV Costs	**$1,044,889.50**
NET BENEFIT	**200,079.45**

In looking at the present value of total benefits and costs in this scenario after a ten-year analysis period, 80% of the contract value paid after one year with subsequent lump sum payments for the remainder produces total present value project costs of $1,044,890. Total present value benefits, with a future value of $1,400,000 (project base value plus 40%) spread evenly over a five-year period, amount to $1,244,969. The difference between the future value and present value benefits and costs is a result of the 3% annual discount factor applied in this analysis. Explained differently, at the end of the ten-year analysis period, the $1,100,000 total cost of the project (base $1,000,000 plus 10% for contingency) would be worth $1,044.890 in today's dollars, and the $1,400,000 future value of the return would be worth $1,244,969. The net benefit produces a total discounted return on investment (ROI) of 19%, which reflects a net gain well in excess of the 3% discount rate.

The net benefit produces a total discounted return on investment of 19%, which reflects a net gain well in excess of the 3% discount rate.

Let's now take a look at the annual breakdown of present value benefits when compared to remaining contract risk.

	Base Year	BY+1	BY+2	BY+3	BY+4	BY+5	BY+6	BY+7	BY+8	BY+9	BY+10	
Costs												
Post-Construction Payment		$ 880,000										
Post-Verification Payment			110,000									
Post-Maintenance Payment									110,000			
Total Costs (Future Value)	$ -	880,000	110,000	$ -	$ -	$ -	$ -	$ -	110,000	$ -	$ -	**TOTAL PV COSTS**
Total Costs (Present Value)	$ -	854,369	103,686	$ -	$ -	$ -	$ -	$ -	86,835	$ -	$ -	1,044,890
Benefits												
Annual Credits Revenue			280,000	280,000	280,000	280,000	280,000					
Total Benefits (Future Value)	$ -	$ -	280,000	280,000	280,000	280,000	280,000	$ -	$ -	$ -	$ -	**TOTAL PV BENEFITS**
Total Benefits (Present Value)	$ -	$ -	263,927	256,239	248,776	241,530	234,496	$ -	$ -	$ -	$ -	1,244,969
Cumulative Benefits (Present Value)		**$-**	**263,927**	**520,166.52**	**768,943**	**1,010,473**	**1,244,969**	**1,244,969**	**1,244,969**			
Remaining Contract Risk (Future Value)		**$(880,000)**	**$(710,000)**	**$(430,000)**	**$(150,000.00)**	**$130,000**	**$410,000**	**$410,000**	**$300,000**			

As you can see from the model, 80% of the contract value paid post-construction in BY+1 results in minimal effects on present value of the project funding from the 3% discount factor. In other words, $880,000 authorized today for a construction contract would be worth $854,369 next year with an annual 3% discount factor. However, deferring the $110,000 post-maintenance payment until eight years into the project produces a significant reduction in present value (worth only $86,835 in BY+8). This represents a loss of economic opportunity to taxpayers, as the same $110,000 could be committed to other governmental services or projects sooner with a greater present value. Note the difference in present value between the $110,000 post-verification payment in BY+2 against the payment in BY+8.

Additionally, with 80% of the contract value paid after construction, this leads to a high outstanding contract risk for the government - and ultimately, the taxpayers. In the event the project is unsuccessful in attaining the desired outcomes, a large portion of the contract is now a sunk cost. In looking at the model, assuming that outcomes and credit revenue streams do materialize as expected, it is only until three years into the project that cumulative present value benefits exceed the balance of the remaining contract value at a ratio of 1.21 or 121%. Though this scenario certainly has the potential to realize outcomes and benefits sooner, the risk is significant in the event the project does not achieve results.

Overall, this model for Pay for Success produces a positive net return of 19%, but the 80% up-front payment presents a high degree of risk in the early stages of the project in the event that outcomes are not verifiable - thus producing reduced or no revenue streams. Additionally, deferring payment for long periods of time presents committed government funds that result in a loss of value to taxpayers due to the discount factor.

Example 2 - The Many Milestones

- $1,000,000 total base project cost
- Assume 20% contingency added in bid price ($1,200,000 total contract cost)
- 60% paid post-construction (base year + 1), remainder in equal installments over five years (project milestones based on outcomes)
- Final construction contract payment in five years (BY+5)
- Proceeds from credits paid out in five-year period post-construction

Ten-Year Cost Benefit Analysis	
Total PV Benefits	$ 1,244,968.94
Total PV Costs	$ 1,132,089.13
NET BENEFIT	112,879.81

This Pay for Success scenario presents equal total present value benefits and slightly higher total present value costs, with a ten-year net present value benefit of $112,880. This reflects a 10% discounted return on investment over the total present value project costs, which again greatly exceeds our target 3% discount factor, but is reduced from the 19% return in our first scenario.

The biggest impact leading to a lower net benefit is the assumption that bid pricing will be higher due to contingency for a PFS contract that only pays 60% post-construction versus 80%. It is difficult to predict exactly how outcomes-based payment models may impact a contractor's bid and how they may account for the risk of project failure - in this case, not meeting project milestones based on outcomes. However, it should be accounted for that bid pricing will likely be impacted if substantially less than the full contract is paid post-construction or if a contractor must obtain third-party bridge financing in anticipation of payment from the government contract.

However, striking a balance between deployment of capital and mitigation of risk for failure to realize verified outcomes is at the heart of PFS. In looking at the model below, Scenario 2 shows a .47 or 47% coverage (present value benefits over outstanding contract value) in BY+2, compared to .37 or 37% in Scenario 1. This leads to lower monetary risk for the government in the project's early stages should outcomes not materialize as anticipated during each project milestone.

Scenario 2 reflects a combination of desired outcomes - a high discounted return on investment realized after ten years (10%) and a good balance with mitigating front-end contract risk by stipulating a lower up-front payment and higher remainder for achieved success metrics. One downside is slightly higher present value costs, due to anticipated contingency reflected in bid pricing. However, the goal in crafting a PFS model is to maximize ROI and early deployment of capital while ensuring accountability for outcomes.

	Base Year	BY+1	BY+2	BY+3	BY+4	BY+5	BY+6	BY+7	BY+8	BY+9	BY+10	
Costs												
Post-Construction Payment		$ 720,000										
Annual Installments Payments			120,000	120,000	120,000	120,000						
Total Costs (Future Value)	$ -	720,000	120,000	120,000	120,000	120,000	$ -	$ -	$ -	$ -	$ -	**TOTAL PV COSTS**
Total Costs (Present Value)	$ -	699,029	113,112	109,817	106,618	103,513	$ -	$ -	$ -	$ -	$ -	1,132,089
Benefits												
Annual Credits Revenue			280,000	280,000	280,000	280,000	280,000					
Total Benefits (Future Value)	$ -	$ -	280,000	280,000	280,000	280,000	280,000	$ -	$ -	$ -	$ -	**TOTAL PV BENEFITS**
Total Benefits (Present Value)	$ -	$ -	263,927	256,240	248,776	241,530	234,496	$ -	$ -	$ -	$ -	1,244,969
Cumulative Benefits (Present Value)		**$-**	**263,927**	**520,167**	**768,943**	**1,010,473**	**1,244,969**	**1,244,969**	**1,244,969**			
Remaining Contract Risk (Future Value)		**$ (720,000)**	**$ (560,000)**	**$ (400,000)**	**$ (240,000)**	**$ (80,000)**	**$ 200,000**					
Ratio PV Benefit to Remaining Risk		**0.00**	**0.47**	**1.30**	**3.20**							

Example 3 - The Holdouts

- $1,000,000 total base project cost
- Assume 40% contingency added in bid price ($1,400,000 total contract cost)
- No up-front payment post-construction
- Contract value paid in equal installments over a twenty-year project period for achieving success metrics
- Proceeds from outcomes (sale of reduction in nitrogen) realized commensurate with annual achievement of success metrics

Ten-Year Cost Benefit Analysis	
Total PV Benefits	$ 533,137.68
Total PV Costs	$ 597,114.20
NET BENEFIT	(63,976.52)

This approach can best be described as the risk-averse model to Pay for Success contracting. No up-front deployment of capital and a lengthy installment period of twenty years lead to significant reduction in net benefit (-$111,581). While this is an extremely safe means of ensuring minimal contract risk for unachieved outcomes, the loss of ROI is extremely significant. **The total ROI is -11%, with an annualized loss of -0.57% per year over 20 years.** The discounting exercise illustrates that this is not a cost-effective use of public funds. Additionally, with virtually all of the risk transferred to the contractor for performance, the model assumes a very high contingency (40%) included in the bid pricing for this scenario.

The sole advantage to this approach is the complete mitigation of remaining contract risk. The governmental entity is only obligated to pay in the event of annual success milestones being achieved. This means that, in essence, this contract is year-to-year and contingent upon environmental metrics being met and verifiable outcomes delivered in a given year. However, this approach swings the pendulum too far in one direction, as the flip side of this model is a much slower deployment of capital and slower implementation of environmental projects. **This diminishes overall net present value benefits and can be viewed as a significant loss of value for the taxpayer.**

Striking a balance between deployment of capital versus mitigation of risk is a key requisition for Pay for Success contract modeling. Of the three scenarios presented, Scenario 2 demonstrates such a balance in desired outcomes and payment structuring. Depending on favorability of bid pricing and a government's risk tolerance, the ratio of upfront payment post-construction to performance-based installments can be adjusted to strike a comfortable medium.

	Base Year	BY+1	BY+2	BY+3	BY+4	BY+5	BY+6	BY+7	BY+8	BY+9	BY+10	
Costs												
Annual Installments Payments		$70,000	$70,000	$70,000	$70,000	$ 70,000	$70,000	$70,000	$70,000	$70,000	$70,000	
Total Costs (Future Value)	$ -	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	**TOTAL PV COSTS**
Total Costs (Present Value)	$ -	67,961	65,982	64,059	62,194	60,383	58,624	56,916	55,259	53,649	52,087	597,114
Benefits												
Annual Credits Revenue		62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	
Total Benefits (Future Value)	$ -	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	62,500	**TOTAL PV BENEFITS**
Total Benefits (Present Value)	$ -	60,680	58,912	57,196	55,530	53,913	52,343	50,818	49,338	47,901	46,506	533,138
Cumulative Benefits (Present Value)		**60,680**	**119,592**	**176,788**	**232,319**	**286,232**	**338,574**	**389,393**	**438,731**	**486,632**	**533,138**	
Remaining Contract Risk (Future Value)		**$ (7,500)**	**$ (15,000)**	**$ (22,500)**	**$ (30,000)**	**$ (37,500)**	**$ (45,000)**	**$ (52,500)**	**$ (60,000)**	**$ (67,500)**	**$ (75,000)**	

Example 4 - The Grant (Control Scenario)

- $1,000,000 total base project cost
- Assume 5% contingency added in bid pricing ($1,050,000 total contract cost)
- All costs paid up-front before construction
- Proceeds from credits paid out in a five-year period post-construction (complete BY+1)

Ten-Year Cost Benefit Analysis	
Total PV Benefits	$ 1,244,968.94
Total PV Costs	$ 1,050,000.00
NET BENEFIT	194,968.94

For this scenario, let's look at what a government grant to a project developer would look like. This setup could best be described as the polar opposite of Scenario 3 - maximum risk. The present value project costs are not impacted by the discount factor, as the grant is paid in full during pre-construction in our base year of the model. On the surface, this seems like a good use of funds, as $1,050,000 deployed today (assume nominal 5% contingency in bid pricing) is worth exactly $1,050,000 and unaffected by the time value of money. **However, the government bears 100% of the risk for the contract and production of verifiable outcomes.**

From looking at the ten-year model above, the ratio of present value benefits to remaining contract risk is zero for the government for the first two years. In other words, all of the capital for the project has been deployed prior to construction in the form of the grant, and if the desired outcomes and resulting credit proceeds do not materialize post-construction, the entire $1,050,000 investment becomes a sunk cost. This also does not reflect good practice for a PFS model in government contracting, as none of the risk transfers to the project developer for the production of outcomes.

In order for the Pay for Success model to work efficiently and effectively, it is critical to balance the total return on investment to the government, the time value of money when operating in the public trust with taxpayer resources, and the monetary risk posed to the government for the project's development and materialization of success metrics.

	Base Year	BY+1	BY+2	BY+3	BY+4	BY+5	BY+6	BY+7	BY+8	BY+9	BY+10	
Costs												
Pre-Construction Grant Payment	$1,050,000											
Total Costs (Future Value)	1,050,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	**TOTAL PV COSTS**
Total Costs (Present Value)	1,050,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	1,050,000
Benefits												
Annual Credits Revenue			280,000	280,000	280,000	280,000	280,000					
Total Benefits (Future Value)	$ -	$ -	280,000	280,000	280,000	280,000	280,000	$ -	$ -	$ -	$ -	**TOTAL PV BENEFITS**
Total Benefits (Present Value)	$ -	$ -	263,927	256,240	248,776	241,530	234,496	$ -	$ -	$ -	$ -	1,244,969
Cumulative Benefits (Present Value)	**$ -**	**$ -**	**263,927**	**520,167**	**768,943**	**1,010,473**	**1,244,969**	**1,244,969**	**1,244,969**			
Remaining Contract Risk (Future Value)	**$ (1,050,000)**	**$ (1,050,000)**	**$ (770,000)**	**$ (490,000)**	**$ (210,000)**	**$ 70,000**	**$ 350,000**	**$ 350,000**	**$ 350,000**			
Ratio PV Benefit to FV Remaining Risk	**0.00**	**0.00**	**0.34**	**1.06**	**3.66**							

FINANCING IMPLICATIONS

We set out to explore how differences in payment schedules might impact the potential for restoration businesses to get financing in the form of equity investments, loans, and the like. Both for-profit restoration firms and nonprofit organizations are typical deliverers of restoration outcomes under Pay for Success programs, but with the relative newness of Pay for Success in restoration, they may have limited financing options. As Pay for Success becomes more common in the restoration space, equity investors, and eventually debt lenders, will grow familiar with it and their risk of investing will go down.

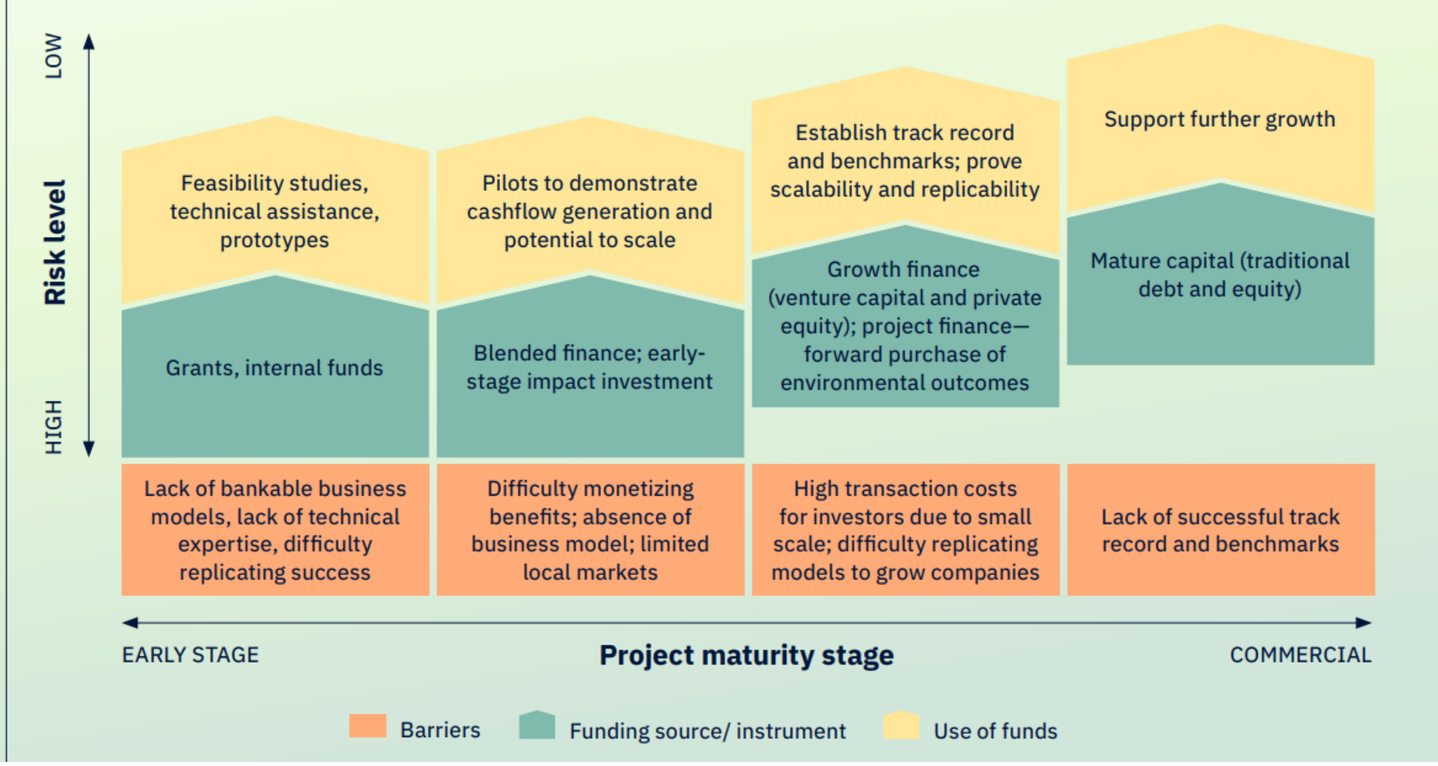
Pay for Success for restoration has been used infrequently enough that debt and equity investors consider it relatively high risk. There are a few reasons for this risk calculation:

1. The **risk of non-performance** presents a challenge; no investor or lender will be comfortable with financing Pay for Success projects if payment is contingent on achieving outcomes that are uncertain to be achieved.
2. **Project sizes are generally considered too small** to attract the attention of investors. This is a common problem with forest carbon projects as well[5].
3. Uncertainty is high due to the regulation, complexity, and fragmentation of restoration outcomes markets. Until the market is more mature and the landscape of regulation is somewhat standardized and better understood, investors will be wary.

Based on these barriers, private equity financing is anecdotally the most common form of financing for restoration firms, including from individuals and institutions. Rather than financing individual projects, equity firms are able to invest in the companies that complete them because equity is better matched to the long time horizons and smaller deal sizes that exist in the space so far. But in a more mature industry, debt financing for individual projects might become a much larger proportion of the financing.

A recent World Bank paper, *Blueprints for Private Investment in Ecosystem Restoration*,[6] offers a helpful timeline to demonstrate how the maturing restoration project development stages impact the availability of capital.

Figure 2. Private finance mobilization at different stages of restoration project development



5. https://content.ces.ncsu.edu/an-introduction-to-forest-carbon-offset-markets
6. https://documents1.worldbank.org/curated/en/099031424202517999/pdf/P1777061820a410fa1a50e1580bed5ade8a.pdf

This figure[7] points to the importance of educating investors through repeatedly developing successful projects and building a proof of concept. The more proven the track record, the lower the risk level and the more available the financing sources.

As the industry matures, there will be benefits to all stakeholders:

- As competition for financing grows with the growth of the sector, the cost for that financing will go down, and therefore project outcomes will be more affordable to buyers.
- As financing becomes easier to access, project proponents will be more likely to submit project bids, which will give buyers more choice of projects to achieve their desired outcomes.
- Project successes and failures will demonstrate where the adaptation needs are, and any feedback can be fed into improving structures and processes.

While government contracts would typically be considered the gold standard in finance (i.e., governmental jurisdictions usually make good on promises to pay, and are longstanding institutions with a proven track record of upholding contract terms), their promise to pay is contingent on delivery of outcomes. Therefore, project payment schedules must be tied directly to straightforwardly defined project outcomes and milestones that are achievable, within the control of project developers, and clearly understood by all parties. Project outcomes that are too much at the mercy of changes in weather or upstream practices, or where the presence of a single invasive plant disqualifies payment, are unreasonable and not likely to attract interest in new project bids.

As the industry takes on more projects using Pay for Success contracting, they will have occasion to test out which kinds of financing are the best fit for projects of all sizes and to educate investors and lenders in the process. This education process should ideally lead to making more financing available to the sector over time.

7. Source: World Bank. 2024. Blueprints for Private Investment in Ecosystem Restoration: Lessons from Case Studies. Washington, DC: World Bank.

RECOMMENDATIONS

We support Pay for Success programs to purchase environmental outcomes and are eager to see the further proliferation of this contract type in the near future. In order for these programs to be implemented successfully, we recommend the following.

Government Agencies:

1. Consider an appropriate payment schedule that balances risk and the value of a dollar. Based on our analysis above, a starting point of 40-60% paid by post-construction is a good starting point.
2. Understand that the risk shift in these contracts skews towards the private sector with this payment scheme. High bonding requirements or onerous financial assurances are no longer needed.
3. Allow for flexibility. Different project types and timelines may require alternative payment schedules. Allow bidders a little flexibility in their payment schedules, either during contract negotiations or upfront during the bidder solicitation process. The most appropriate payment schedule will also likely change as the market matures.

Legislators:

1. Similar to the third government agency recommendation, ensure that any legislation that authorizes or clarifies Pay for Success programs includes flexibility in allowable payment schedules. Rigid schedule requirements can hinder certain projects and prevent small-, women-, or minority-owned businesses from applying.
2. Do not include onerous financial assurances and/or bonding requirements in legislation. If the relevant procurement codes do require certain assurances, review them and make sure they are still relevant for these programs. Exemption clauses may be appropriate.

Investors:

1. Provide feedback to legislators and program managers regarding what kinds of payment schedules and program design elements contribute to higher or lower investment risk and that therefore impact the availability of capital to invest in the restoration economy.
2. Seek out opportunities to learn about outcomes-based restoration and to partner with nonprofits or credit enhancement programs to test the waters.

APPLICATIONS FOR OTHER PROJECTS

Applications of these recommendations on green and gray infrastructure projects

1. Lead Service Line Replacement Projects
Lead service lines are unfortunately found throughout the country and pose a risk to public health in many communities. President Biden has made replacing lead service lines a high priority for his administration and has deployed $15 billion in Bipartisan Infrastructure Law (BIL) toward fixing this issue. The Biden-Harris Administration has also set the ambitious goal of replacing all lead service lines within a decade in the proposed Lead and Copper Rule Improvements (LCRI).

These projects, especially in communities with high numbers of lead pipes, can be complicated by the need for homeowner permission, the ability of local governments to pay for the replacement of pipes on private property, and workforce and supply chain issues. However, this process could be sped up significantly by using Pay for Success to shift the risk over to the private sector as described above, coordination of communities, and using lead pipes as a unit outcome.

Contracts could be structured such that payments are calculated based on a predetermined per-pipe price. This incentivizes the contractor to scale quickly and replace pipes in a systematic, efficient manner to capitalize on economies of scale. We have already seen contracts similar to this in Wausau, Wisconsin which is utilizing the per-pipe price model.

2. Culvert Restoration & Replacement Projects
Culverts dot the landscape of many states, allowing water to move under roadways but in a constrained way that impairs fish and other species' passage in streams and riverways. According to the U.S. Department of Transportation (DOT), there are almost 70 million culverts under roads that were built using designs that neglected impacts on aquatic species in the nation's waterways.[8]

Through the IIJA, the Federal Highway Administration's (FHWY) Culvert Aquatic Organism Passage (AOP) Program has received roughly $1B that is eligible to be spent on culvert restoration. While this is phenomenal, these funds must be spent by FY26, creating an almost unrealistic timeline to execute these important projects.

While some of the challenges specifically associated with culver restoration projects (e.g., cost variability due to site-specific design and permitting considerations) might make Pay for Success difficult to implement, alternative procurement methods like Public-Private Partnerships (P3s) or full delivery contracts (of which Pay for Success is a sub-type) could greatly benefit the speed and scale of culvert restoration. Please see EPIC's white paper, Alternative Delivery Procurement Approaches for the Federal Highway Administration's Culvert Aquatic Organism Passage (AOP) Program for further information.

3. Mitigation banks' credit release schedules
Environmental mitigation banks, used to offset new development, must be approved by the US Army Corps of Engineers. Each Corps district is able to use its own discretion when approving/determining the credit release schedule that mitigation bank projects must follow. Generally speaking, an initial portion of credits are released after the site is secured, the plans are approved, required financial assurances are established, etc. Then, the rest of the remaining credits cannot be sold until specified ecological milestones have been met.

The lack of standardization is very frustrating for mitigation bankers because different Corps districts have different views on what is and isn't acceptable. Credit release schedules that hold the vast majority of credits for many out-years have big financing implications for the mitigation bankers doing these projects. Not only is it extremely costly, they aren't reliably linked to actual ecological outcomes. Our suspicion is that these long tails are essentially arbitrary in some cases. The Corps did issue a Regulatory Guidance Letter on this exact subject in 2019, providing guidance on how to approach credit release schedules.

8. https://www.transportation.gov/briefing-room/biden-harris-administration-announces-first-ever-grants-fix-more-160-fish-culverts

A Corps-wide standardization of credit release schedules will make it more practical for mitigation bankers and ensure that payments are triggered by realized success. Generally following our proposed Pay for Success payment schedule could apply well in this scenario as well.

4. Forest Carbon and Biodiversity Markets
Similar to the mitigation banking world discussed above, other environmental markets like the forest carbon market and the emerging biodiversity credit market have the same conflict between credit developers wanting early payments and credit buyers wanting assurances that their money is paying for real ecological success.

Similar to the mitigation banking world, there has not been a standardized approach to these projects' credit release schedules, which has spurred continuous discussion among stakeholders. Generally speaking, there are two approaches that mirror our "Frontloaders" and "Holdouts" scenarios discussed above:

1. Ex-ante: credits are issued before to desired outcome has been achieved (Analogous to "Frontloading" as we term it above) - which is favored by credit developers
2. Ex-post: credits are issued after the outcomes are realized (i.e. "Holdouts") - often favored by advocates of high-integrity projects and buyers alike.

As the biodiversity credit market comes to fruition, we must wrestle with variability in timescales of ecological response (a desired outcome may take five years to realize in one biome, compared to decades in another) and payment timelines. This takes us back to our argument to find the balance between risk mitigation (paying for already-proven results) and financing costs (the earlier the better for project developers).

Environmental Pay for Success is ahead of biodiversity markets in terms of development, and broadly speaking are very similar concepts. Those developing biodiversity markets can take the lessons learned from Pay for Success programs (as well as the forest carbon and mitigation banking worlds) to create credit release schedules that strike an appropriate balance of risk and integrity for the credit buyers and sellers while delivering real ecological outcomes.

CONCLUSION

Simply put, payment schedules are important considerations when designing Pay for Success programs. Improper schedules can exclude or turn off potential bidders (especially small, minority- and women-owned businesses), increase project pricing, and create unnecessary hurdles to securing financing.

While each program and desired environmental outcomes may require unique considerations, EPIC recommends considering paying 40-60% by post-construction, reserving the remaining 40-60% for outcome delivery and verification.

EPIC's Procurement Policy staff have assisted government agencies in seeking Pay for Success authorization, as well as designing new programs. If you are interested in discussing Pay for Success further, please contact Grace Edinger, Procurement Policy Strategy Lead at EPIC, grace@policyinnovation.org.