STATE OF NORTH CAROLINA UTILITIES COMMISSION RALEIGH

DOCKET NO. E-100, SUB 190

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of Biennial)	DIRECT TESTIMONY
Consolidated Carbon Plan and Integrated)	AND EXHIBITS OF
Resource Plans of Duke Energy Carolinas,)	BRADFORD D. MULLER
LLC, and Duke Energy Progress, LLC,)	ON BEHALF OF
Pursuant to N.C.G.S. § 62-110.9 and § 62-)	CIGFUR II & III
110.1(c))	

1	Q	PLEASE STATE YOUR NAME.					
2	A	Bradford D. Muller.					
3	Q	WHAT IS YOUR OCCUPATION?					
4	A	I am a Vice President at Charlotte Pipe and Foundry Company ("Charlotte Pipe").					
5	Q	PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND					
6		EXPERIENCE.					
7	A	This information is included in Appendix A to this testimony.					
8	Q	ON WHOSE BEHALF ARE YOU APPEARING IN THIS PROCEEDING?					
9	A	Charlotte Pipe and other industrial manufacturers and large energy users in North Carolina,					
10		by way of membership in the Carolina Industrial Group for Fair Utility Rates ("CIGFUR").					
11	Q	WHAT PRODUCTS DOES CHARLOTTE PIPE MANUFACTURE? WHAT ARE					
11 12	Q	WHAT PRODUCTS DOES CHARLOTTE PIPE MANUFACTURE? WHAT ARE CHARLOTTE PIPE'S ELECTRICITY NEEDS AT ITS NORTH CAROLINA					
	Q						
12	Q A	CHARLOTTE PIPE'S ELECTRICITY NEEDS AT ITS NORTH CAROLINA					
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more than 1.5 million square feet with a peak demand of 13 megawatts. Both locations are extremely sensitive to power quality and reliability incidents, especially Charlotte Pipe's plastics plant in Monroe, which takes electric service at retail from Duke Energy Carolinas, LLC ("DEC").

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In addition, we operate plastic pipe and fitting plants in Alabama and Utah, as well as plastic pipe plants in Florida, Texas, and Pennsylvania (with another pipe plant under construction in Kansas). We also operate cast iron foundries through a wholly-owned subsidiary in Neenah, WI; Medley, FL; and Lincoln, NE, where we make manhole covers and rings, tree grates, and other municipal castings.

Our plants consume substantial amounts of electricity and with our varied geographic footprint—operating 10 plants in eight (8) states—we have a broad view of the State, regional, and national energy market when it comes to cost, reliability, and power quality. In fact, the availability and price of energy is one of the top three considerations we study when deciding where to site a plant.

WHAT HAS CHARLOTTE PIPE ACCOMPLISHED TOWARDS INDUSTRIAL DECARBONIZATION EFFORTS?

When we built the new foundry in Oakboro, we made the decision to switch from a fossil-fuel cupola melt system that uses coke (a form of coal) to an electric melt system, which will eliminate 40,000 tons of CO2 emissions per year. The new foundry emits a minimal amount of carbon for a facility of its size—the 500,000 square foot plant emits only about 4,300 tons of CO2 annually. The switch, however, made power costs, reliability, and power quality even more critically important factors in operating the plant.

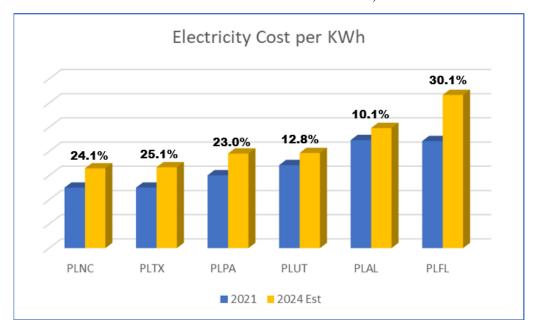
Q IN YOUR ROLE AS A MEMBER OF THE CHARLOTTE PIPE AND FOUNDRY

EXECUTIVE TEAM, DO YOU HAVE KNOWLEDGE AND UNDERSTANDING

OF CHARLOTTE PIPE'S ENERGY USAGE AND NEEDS?

Yes. Power is critical for our manufacturing operations and one of our highest cost inputs. As such, we manage it very closely. For example, the chart below reflects the steep increases in electricity costs at our plastic plants by state at present as compared to just three years ago. North Carolina and Texas are near parity in rates but only Texas and Florida are expected to show greater rate increases than North Carolina over the same time frame. Importantly, the chart below reflects only potential non-CPIRP related rate and fuel increases and does <u>not</u> factor in any Carbon Plan-related capital costs contemplated in the implementation of House Bill 951 (S.L. 2021-165), as those are only just starting to be incurred by Duke Energy.

FIGURE 1: ESTIMATED ELECTRICITY COST INCREASES PER KWH FOR CHARLOTTE PIPE'S LOCATIONS, 2021 vs. 2024



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1	Q	HOW IMPORTANT ARE FACTORS SUCH AS ENERGY AVAILABILITY,
2		RELIABILITY, AND PRICE IN CHARLOTTE PIPE'S BUSINESS AND
3		OPERATIONAL DECISIONS?
4	A	Our manufacturing processes are very energy-intensive and are extremely sensitive to the
5		price, reliability, and quality of our power supply.
6		Energy is a top three expense for manufacturers, along with labor and raw materials.
7		Manufacturers compete locally, regionally, and globally. When the price of energy at a
8		facility is no longer competitive, manufacturers face two choices: either shift production
9		(and the corresponding jobs and electricity load) out of state where energy is less expensive
10		or close the plant altogether and cease operations. At a minimum, this would negatively
11		impact capital investment decisions to potentially modernize or expand a plant that is
12		economically uncompetitive.
13		Power interruptions, even momentary flickers, take an enormous toll on our
14		manufacturing equipment, processes, and production output. For example, on May 27,
15		2022, one of our plastics plants experienced a 23-millisecond voltage sag that caused four
16		pipe extrusion lines to go down, scrapping 3,180 pounds of material. We subsequently lost
17		10,753 pounds of product we could not produce while the machines were down—lost
18		production we can never get back.
19	Q	HAVE YOU REVIEWED INDIVIDUALIZED RATE IMPACT PROJECTIONS
20		FOR CHARLOTTE PIPE IF THE P3 FALL BASE PORTFOLIO IS

IMPLEMENTED AS PROPOSED BY DUKE?

Yes, Charlotte Pipe analyzed the rate impacts of the Carbon Plan on our two major North
Carolina plants. Our Monroe plastics plant, which is a DEC customer, is projected to see
monthly rates nearly double from 2024 to 2038 based on bill impacts associated with
proposed new generation assets called for by Duke's most recent Carbon Plan filing—but
this is not an <i>all-in</i> cost projection.

We do not view this as meeting the "least cost" requirement of HB 951, nor do we view this as a "reasonable step," contrary to what is required by law as the Carbon Plan is implemented.¹

The picture is more dire for our 72-MW foundry in Oakboro, North Carolina. If the Oakboro Foundry was to become a DEC retail customer, its monthly electricity costs would *triple* by 2038—again, taking into account only the costs and associated rate impacts of new generation resources selected in the Carbon Plan.

These projected rate hikes are incremental to the 24.1% increase from 2021 to 2024 shown in the figure above. These rate increases are unsustainable, and it is simply not possible for any manufacturer to pass electricity rate increases of this magnitude on to customers and hope to keep those customers.

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¹ See G.S. 62-110.9.

Q	IN YOUR	OPIN	NION, IS IT FAI	R TO SA	Y THE PRO	OJEC	TED RATE IN	MPACTS
	RELATEI	о то '	THE CPIRP AS	PROPOS	ED BY DUK	E PO	SE AN EXIST	ENTIAL
	THREAT	TO	CHARLOTTE	PIPE'S	ABILITY	TO	CONTINUE	DOING
	BUSINESS	S IN N	ORTH CAROL	INA?				

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Not many businesses can absorb doubling or tripling of their energy costs and remain in business, as we would be unable to pass such massive price increases along to our customers to cover our costs. Our customers would be forced to buy from producers not subject to such high electric rates—most likely foreign producers who pollute heavily and make relatively few efforts to reduce their reliance on fossil fuels compared to the United States.

The completely predictable consequence of driving manufacturing out of North Carolina is that these manufacturing facilities will end up operating abroad in countries where they are still building new coal-fired electric generating facilities. Instead of reducing emissions, Duke's Carbon Plan would ironically result in *increasing* global emissions.

We have already seen where we are headed. Europe is about a decade ahead of us in its electricity generation decarbonization efforts and the result has been significant demand destruction/erosion in energy-intensive industries and the de-industrialization of the continent, with many permanent closures of industrial capacity in Europe that will not come back.

In a similar but slightly different context, the Public Staff has noted that much higher electricity rates would make it "increasingly difficult, if not impossible, to recruit new economic development into DEP's service territory[.]"² Worse, "the higher electricity costs will likely drive out existing businesses."³ Over time, higher electricity rates will make North Carolina less attractive for Charlotte Pipe as we consider where to make future capital investments in our plants.

ARE YOU FAMILIAR WITH THE PROJECTED RATE IMPACTS ASSOCIATED WITH EARLY COAL RETIREMENT AND REPLACEMENT THAT WERE SOCIALIZED WITH MEMBERS OF THE NORTH CAROLINA GENERAL ASSEMBLY IN 2021 BEFORE HOUSE BILL 951 WAS SIGNED INTO LAW?

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Yes. In a bill impact analysis provided to the NC General Assembly by the Public Staff in 2021, incremental residential rate impacts were expected to be \$1 dollar per month by 2030 and \$1 per month by 2035 for DEP, and \$5 per month by 2030 and \$3 per month by 2035 for DEC. In just under three years since House Bill 951 was signed into law, these cost estimates have now skyrocketed for residential customers to be just shy of \$60 per month by 2033 and \$80 per month by 2038 for DEP, and just over \$50 per month by 2033 and just under \$80 per month by 2038 for DEC. Attached hereto and identified as Exhibit BDM-1 is a true and accurate copy of the Public Staff's bill impact analysis dated July 9, 2021, which was socialized among members of the NC General Assembly before they ultimately voted in favor of enacting HB 951 into law.⁴

² Tr. vol. 23, p. 97, Docket No. E-100, Sub 179 (Testimony of Public Staff witness James McLawhorn).

³ *Id*.

⁴ As noted on the face of the Public Staff's bill impact analysis, attached hereto and identified as Exhibit BDM-1, the Public Staff's bill impact analysis was prepared as of July 9, 2021, based on review of the bill then pending in the House. Upon information and belief, no additional rate impact analysis was prepared by the Public Staff of the version of the bill introduced in the Senate or ultimately passed by the General Assembly.

What's more alarming is Duke Energy has yet to provide any Carbon Plan-related, let alone *all-in*, rate increase projections for industrial customers for the planning horizon (through 2038). Instead, Duke's non-residential customers have been forced to extrapolate potential rate increases from projected residential impacts. We suspect the shocking residential rate projections will pale in comparison to what industrial customers could expect to pay to achieve carbon neutrality.

A fundamental problem with the vertically integrated monopoly utility model is that utilities can recover the full cost of an asset, plus the guaranteed opportunity to earn a predetermined rate of return, even if that asset turns out not to be necessary to serve load, is not the most cost-effective means of serving load, does not contribute to maintaining or improving grid reliability as required by G.S. 62-110.9(3), and/or is substituted or cancelled despite already being recovered in rates through Multi-Year Rate Plans (MYRPs). Duke has every incentive—and opportunity—to gold-plate its generation system, not to mention the related transmission buildout and network upgrades, in the name of "load growth" and "carbon emissions reductions." It is incumbent upon the NC Utilities Commission to be exceedingly judicious, erring on the side of caution, to prevent this from happening.

It would be fairer to ratepayers, who at present are being asked to shoulder virtually all of the risks of Duke overbuilding and overspending as it implements the Carbon Plan, if even some of these financial risks could be shifted from customers to the utility's shareholders. G.S. 62-110.9 requires the Commission merely to take "all *reasonable* steps" to achieve the State's aspirational CO2 emissions reductions goals.⁵ It does not require

⁵ Emphasis added.

1		achieving the emissions reductions goals at any cost or at any impact to the reliability of
2		the electric grid. The Commission should consider implementing rate mitigation measures
3		associated with Carbon Plan spending to protect ratepayers from some of this extraordinary
4		risk and exposure.
5	Q	HOW DO THE PROJECTED RATE IMPACTS PROVIDED BY THE PUBLIC
6		STAFF TO THE NC GENERAL ASSEMBLY COMPARE TO PRESENT-DAY
7		RATE IMPACT PROJECTIONS?
8	A	They are night and day; a complete juxtaposition.
9		What is also concerning is that we do not have transparency on total all-in Carbon
10		Plan costs, nor projected costs that are <u>not</u> related to implementation of the Carbon Plan.
11		However, the current estimate is jaw dropping enough – \$149 billion, or nearly 5x
12		North Carolina's current biennial budget.
13		We can see where we are headed. Electric rates under California utility PG&E have
14		increased 127% in the past decade along with surging costs for wildfire prevention and
15		grid upgrades. It is my understanding that nearly a quarter of the PG&E's customers are
16		now delinquent on their bills.
17	Q	ARE YOU AWARE THAT HOUSE BILL 951 (ENACTED INTO LAW AS
18		S.L. 2021-165) REQUIRES ONLY THAT THE NCUC TAKE "ALL REASONABLE
19		STEPS" TO ACCOMPLISH THE CO2 EMISSIONS REDUCTION GOALS SET
20		FORTH THEREIN?
21	A	Yes, I am aware of that language. The bill requires steps taken toward the aspirational
22		goals (not mandates) of carbon reduction to be "reasonable." Duke and the NCUC must
23		also comply with "current law and practice" regarding "least cost planning of generation"

and any steps taken must "maintain or improve upon the adequacy and reliability of the existing grid."

What the bill lacks, however, are consensus definitions of the "least-cost" path, "most reliable" path, and what does and does not constitute a "reasonable" step. Our current nuclear facilities are by far the lowest-cost, most efficient, most reliable, fully zero-emissions generation source available. There is absolutely no way to replace any of our preexisting nuclear generation with any other source of generation without making electricity cost more and emit more CO₂.

IN YOUR OPINION, DOES THE CPIRP AS PROPOSED BY DUKE CONSTITUTE A "REASONABLE STEP" IN LIGHT OF THE PROJECTED COSTS AND ASSOCIATED RATE IMPACTS?

No, the CPIRP as proposed by Duke does not constitute a "reasonable step" considering the projected capital costs and associated rate impacts. How do we know this will effectively reduce emissions and is worth the exorbitant cost and risk to reliability? In short, we don't. None of this to me constitutes "reasonable steps" as the North Carolina General Assembly intended.

IN YOUR OPINION, SHOULD NORTH CAROLINA CONSIDER EXTENDING THE TIMELINE FOR ACHIEVING THE CO2 EMISSIONS REDUCTIONS SET FORTH IN HOUSE BILL 951 TO ENABLE A LESS COSTLY ENERGY TRANSITION?

Retiring all of North Carolina's 8,400 MW baseload coal-fired power plants — 30% of the state's generation — is at the heart of NCUC's Carbon Plan. At the same time, Duke

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⁶ G.S. 62-110.9.

estimates we need to add significantly more new generation capacity above and beyond the capacity needed to replace the retiring 8,400 MW of coal-fired generation just to meet expected demand (assuming all the new predicted demand is under contract and not just speculative load based on economic development potential).

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Last year, the North American Electric Reliability Corporation ("NERC") made it clear for the first time that energy policy is a threat to reliability. A copy of NERC's December 2023 Long-Term Reliability Assessment is attached to my testimony and identified as Exhibit BDM-2. According to the NERC, most of North America is at elevated/high risk of electricity shortfalls between 2024-2028.

Despite these warnings, under HB 951 North Carolina intends to shutdown baseload generation before the end of these units' economically useful lives, all while demand for power grows exponentially, while at the same time driving up need for higher reserve margin (and therefore higher capital costs). In my view, baseload generation should replace baseload generation to maintain enough power to meet the growing demand.

To avoid rationing and black outs, we need to extend the timeframe for implementation of HB 951's aspirational emissions reduction goals unless/until DEP and DEC have merged and accelerate the transition to carbon-free nuclear power. Based on the reality of state's power needs, in my opinion, these are the only "reasonable steps" that can be taken without harming the state's economic development or driving ratepayers into energy poverty.

TURNING NOW TO RELIABILITY, CAN YOU TELL US WHY RELIABILITY IS IMPORTANT TO CHARLOTTE PIPE'S OPERATIONS?

As noted above, carefully balancing supply with demand every minute of the day, 365 days a year is increasing more difficult as more numerous variables and complexities are added to the system. A simple voltage sag can disrupt Charlotte Pipe's plastic extrusion lines, abruptly shutting down machines or otherwise damaging equipment, causing electrical fires, and destroying product.

Charlotte Pipe has serious concerns that Duke Energy may not be able to ensure the reliability and resiliency of North Carolina's grid. We've already seen the dramatic and near catastrophic rolling black outs and volatile grid conditions over the Christmas holiday in 2022. If that situation had happened on a normal working day instead of a holiday weekend, the results would have been catastrophic – or at a minimum, would have posed a far greater hardship for North Carolina businesses and residents.

WHAT CAN HAPPEN IN ONE OF YOUR FACILITIES IF IT EXPERIENCES EVEN A MOMENTARY POWER FLICKER?

The consequences of power quality incidents for Charlotte Pipe are very costly in scrapped product, lost production time, cost of equipment repair, and unproductive and misaligned labor. More important than the economic impacts, they also pose a safety hazard in that they can cause fires, putting life and limb at risk. You can see from the table below from 2022 how extremely short duration sags can take out multiple extrusion lines at our plants.

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TABLE 1: MOMENTARY POWER INTERRUPTIONS IN 2022 AT CHARLOTTE PIPE'S PLASTICS FACILITIES IN MONROE, NC

Event Summary

Event	Date	Duration	Voltage Sag	# lines Down	Cause
1	3/18/2022	32ms	70%	11	Unknown
2	5/27/2022	23ms	71.90%	3	High Winds
3	5/28/2022	33ms	70.50%	3	high winds
4	6/25/2022	14ms	67.60%	11	Bad Thunder storms
5	7/2/2022	65ms	57.90%	4	severe Thunderstorms
6	7/6/2022	64ms	59.60%	1	unknown
7	7/14/2022	47ms	68.60%	1	Storm

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IN YOUR OPINION, SHOULD NORTH CAROLINA CONSIDER EXTENDING THE TIMELINE FOR ACHIEVING THE CO2 EMISSIONS REDUCTIONS SET FORTH IN HOUSE BILL 951 TO ENSURE DUKE WILL BE ABLE TO ADEQUATELY SERVE LOAD, ENSURE THAT RELIABILITY IS MAINTAINED OR IMPROVED, AND MITIGATE DETRIMENTAL EFFECTS ON RATEPAYERS?

Yes, extending the timeline for achieving the CO2 emissions reductions set forth in House Bill 951 would be a "reasonable step" within the statute as written, particularly given the discretion delegated to the Commission in implementation of the aspirational CO2 emissions reduction goals. I have strong reason to believe several members of the North Carolina General Assembly who were involved with the enactment of House Bill 951 would agree with this statement, particularly under the circumstances of unconstrainted upward pressure on electric rates. Carbon emissions reduction goals and corresponding deadlines are inherently arbitrary. North Carolina should slow down and ensure reliability to meet explosive demand and allow innovation to catch up.

However, in my view, North Carolina should take it a step further and use the flexibility within HB 951 to require that Duke model a scenario in which DEP and DEC

are able to share capacity for planning purposes and be incredibly judicious with the Near-Term Actions it approves to protect ratepayers against the risks and exposure associated with Duke overbuilding and overspending. If for some reason either of the aforementioned are not possible, the Commission should consider pausing or delaying steps toward achieving North Carolina's aspirational CO2 emissions reductions targets until the planned merger and integration between DEC and DEP is completed. This will help to protect ratepayers against the risks and exposure associated with Duke overbuilding and overspending, as well as the ongoing regulatory risk posed by the possibility that South Carolina rejects capital investments related to the implementation of North Carolina's Carbon Plan, which in turn exposes North Carolina ratepayers to the risk that Duke Energy will attempt to recover those costs that would have otherwise been allocated to South Carolina ratepayers from North Carolina ratepayers instead.



Bradford D. Muller

Vice President, Corporate Communications Charlotte Pipe and Foundry Company



Brad is a marketing and communications strategist with more than thirty years of experience in public and corporate affairs, international and government relations, manufacturing and business marketing, crisis management and media training, and more.

Brad spent nearly a decade in Washington, DC, including stints with the U.S. State Department and Edelman Worldwide, the largest public relations and public affairs agency in the world.

Currently, Brad leads government affairs, marketing and corporate communications for Charlotte Pipe and Foundry Company, a fifth-generation, family-owned manufacturer based in North Carolina. Founded in 1901, Charlotte Pipe and Foundry is the leading U.S. producer of cast iron and plastic pipe and fittings for plumbing systems.

Brad worked for the U.S. State Department's Agency for International Development (A.I.D.) in the George H.W. Bush Administration as a desk officer, managing foreign aid programs for Afghanistan and later for Bulgaria and Albania after the 1989 fall of the Berlin Wall.

At Edelman, Brad worked for the late Michael Deaver, former Deputy Chief of Staff to President Ronald Reagan, on a variety of public affairs and international relations issues, including the passage of the North American Free Trade Act (NAFTA).

Brad is very active within the metalcasting industry and his local community, including:

- Leadership roles over the last decade with the American Foundry Society, including incoming president of AFS in 2023, the Cast Iron Soil Pipe Institute and the Municipal Casting Association.
- Providing written and verbal testimony as an industry representative and subject matter expert on manufacturing and regulatory matters before two U.S. House of Representatives subcommittees and the Small Business Administration.
- Advisor to the U.S. Department of Commerce Industry Trade Advisory Committee on Steel and Iron (ITAC) since 2014.
- Member of the U.S. Chamber of Commerce Labor Relations Committee since 2008.
- Served on boards of the YMCA of Greater Charlotte, the Charlotte Chamber of Commerce, the North Carolina Chamber, the John Locke Foundation, and the Charlotte Mecklenburg Police Foundation (former board chair).

PROFESSIONAL EXPERIENCE

CHARLOTTE PIPE AND FOUNDRY COMPANY - CHARLOTTE, NC

Vice President of Corporate Communications, 2002 - Present

- Senior management with fiduciary responsibility as an Officer of the company
- Corporate spokesperson and media contact
- Active role in various industry trade associations
- Leads the company's Government Affairs practice
- Responsible for marketing and branding strategic planning and execution

PRICE / McNabb - Charlotte, NC

Senior Account Executive, 1995 - 2002

 Managed corporate branding, advertising and public relations programs for numerous clients, including Square D Company and its French parent, Schneider Electric.

EDELMAN WORLDWIDE - WASHINGTON, D.C.

Account Supervisor, 1993 - 1995

• Developed and executed strategic communications, media relations and public affairs programs for a variety of clients, including the Portuguese Trade Commission; the Embassy of India; the city of St. Petersburg, Russia; and Bank of Boston's Global Initiative.

U.S. STATE DEPARTMENT, AGENCY FOR INTERNATIONAL DEVELOPMENT - WASHINGTON, D.C.

A.I.D. Desk Officer and Special Assistant, 1989 - 1993

Special Assistant to the Assistant Administrator for Europe, April 1991 – January 1992

 Responsible for a range of operational, advisory, and supervisory activities for the Assistant Administrator for the Bureau for Europe. Supervised Executive Secretariat operations and personnel.

Desk Officer, Bureau for Europe, March 1990 – April 1991 / January 1992 – February 1993

- Directed and supervised \$90 million assistance program for Albania, a \$34 million aid package for Bulgaria and an annual \$20 million U.S. contribution to the International Fund for Ireland.
- Primary liaison for communicating A.I.D. policy and program details to U.S. Embassy staff
 overseas and host country officials in Washington. Traveled extensively overseas to supervise
 aid programs in-country.

Temporary A.I.D. Representative to Albania, January 1992

 Monitored economic and humanitarian assistance in-country for the U.S. Ambassador, including delivery and distribution of critical U.S. food shipments via Greece.

Project Officer, Afghanistan Task Force, May 1989 – March 1990

 Working in Washington and in Pakistan, collected and analyzed data concerning UN and other donor activities related to refugee assistance programs.

PRESIDENTIAL TRANSITION TEAM / WHITE HOUSE STAFF - WASHINGTON, D.C.

• Office of Presidential Personnel, November 1988 – May 1989

BUSH / QUAYLE '88 PRESIDENTIAL CAMPAIGN - WASHINGTON, D.C.

• Scheduling Office, July - November, 1988

EDUCATION

KENYON COLLEGE, Gambier, Ohio Bachelor of Arts, Political Science, 1988